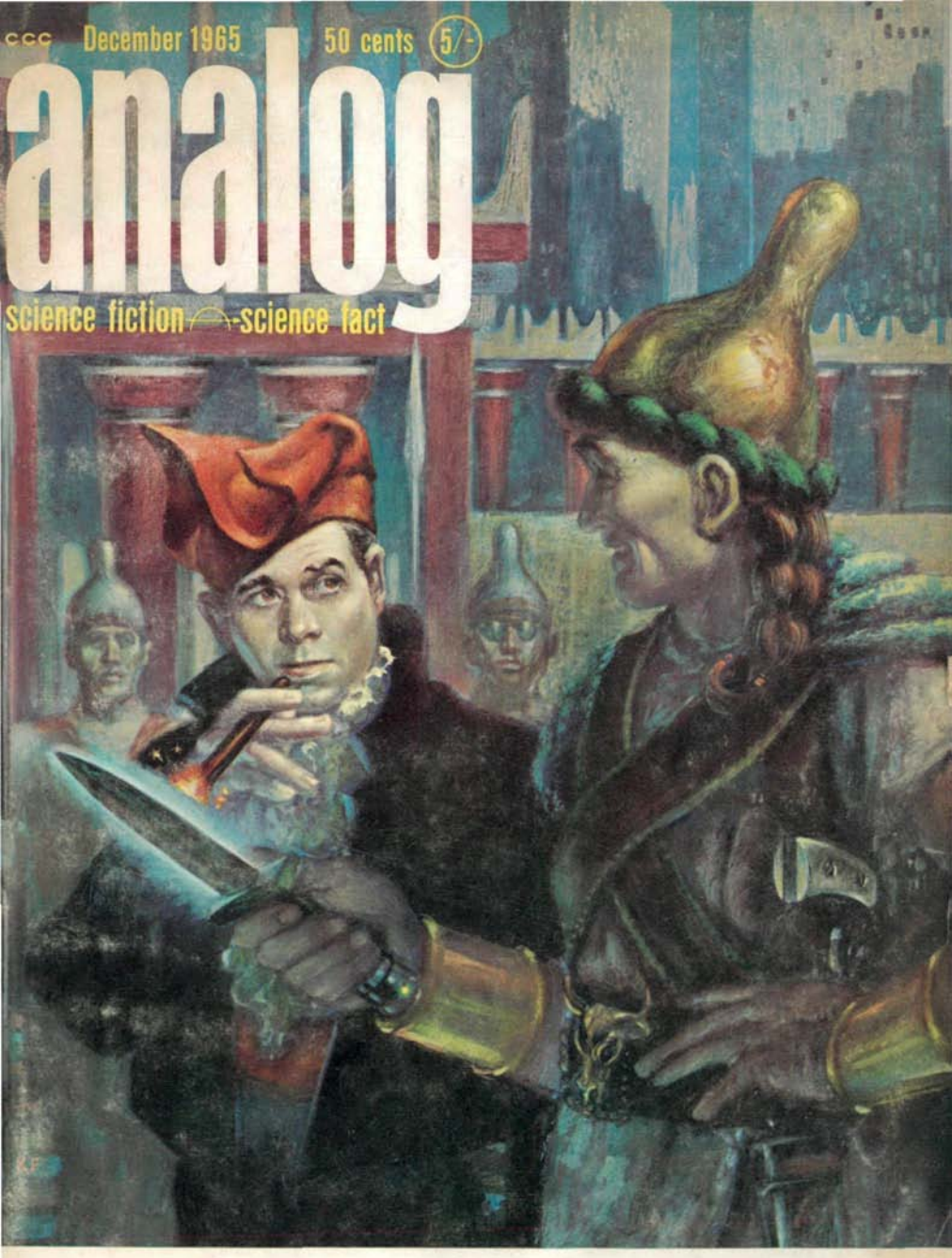

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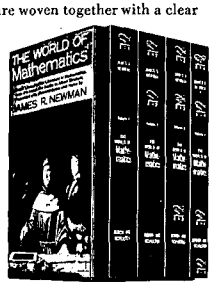

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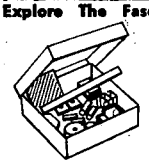

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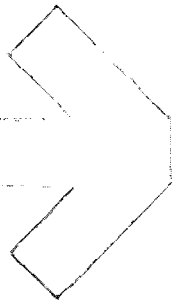
Editorial by John W. Campbell



BREAKTHROUGH IN PSYCHOLOGY!

Life magazine, a few months ago, announced a startling breakthrough discovery in psychology made at a California research clinic. Some psychologists there had come up with the amazing discovery that punishment—hurting a child deliberately, for cause—actually helps children to grow into sounder personalities.

This startling discovery comes a little late, however. It seems to have been anticipated some hundreds of millions of years ago, when mammals first developed from the reptilian predecessors.

The psychological doctrine of "Mustn't punish a child; it might hurt his precious little ego" derives strictly from the reptilian division of the animal kingdom. They never punish their young. They're apt to eat them, of course, if they encounter them—but there's nothing of intent to hurt; it's simple hunger that motivates them.

The greatest of the mammalian inventions was not live birth—some of the earliest sharks gave birth to live young. The mammals invented reward and punishment for their young—guidance. Punishment was the great mammalian invention—a substitute for being eaten alive when the individual made a mistake.

Of course, the Freudian notion that "sex is the only instinct" explains the young animal's tendency to seek the mother on the basis of an Oedipus Complex, overlooking the fact that young mammals are thermotropic and hungry and could —just possibly—have certain other instinctual drives.

After some 150 megayears, it's reasonable to suppose that young mammals have a built-in expectation of being guided by punishment and reward—and that failure to offer that guidance introduces stresses into the young mammal. Certainly failure to give reward—affection and attention—is known to have a literally lethal effect on human babies. It's been proven that babies given every objective necessity of life—food, warmth, cleanliness, excellent medical care—have a near one hundred per cent death rate if they get *only* the objective necessities. But a baby born in a cold drizzle, deprived of shelter, undernourished by a half-starved mother,

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survives and grows—if that half-starved mother strives to care for it and keep it.

Isn't it reasonable to assume that if one half of the ancient instinctual pattern is necessary, the other might be, too? The worst kind of lie is a half-truth; if you are entering a strange environment, and I tell you only what you should do, and omit all warnings of danger, things you should not do, I could arrange very neatly to have you kill yourself.

The psychological dictum of "Punishment is bad; it is mere desire for vengeance," has, of course, seeped over into the sociology of our times. The trite and stupid argument that punishing a criminal does no good, because it's mere vengeance, and capital punishment is useless because, after all, it has never stopped murder, takes off happily from that psychological crackpotism. The argument that punishment doesn't stop crime is equivalent to saying: "We shouldn't try to stop drunken driving, because even when we have laws against it, drunks still drive."

It spreads and digs in deeper, and comes up with the wonderful idea that the young criminal shouldn't be clouted for his vandalism; he should be gently scolded, and encouraged to do better.

There's the old saying that: "Power corrupts; absolute power corrupts absolutely." It's a false statement. Power has almost no correlation with corruption—they're completely independent variables. If it were true, then it would necessarily follow that God Almighty was the ultimate in corruption.

The true statement is *"Immunity corrupts; absolute immunity corrupts absolutely."*

The current clamor about "police brutality" stems from the basic idea that individuals should be free of punishment—i.e., *that criminals should be immune.*

The automatic consequence of that increasing degree of immunity is the observed increasing corruption, the increasing vandalism of JDs, which recently expressed itself in several hundred million dollar damages in Los Angeles. The City of the Angels turned up with some red-hot demons on the loose.

It's worth noting that the total amount of property damage the Los Angeles vandals did to that city probably exceeded the total of property destruction the Vandals did to the city of Rome when they sacked it.

The "brutal" actions of police consist of punishing criminal behavior.

We have problems—very serious and pressing problems—concerned with social relationships in our culture. And you do not solve problems by denying that they can possibly really exist, or by denying that their actual cause could possibly be the cause. If your car stalls because

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the ignition wire is broken, filling the gas tank won't restart it. Cleaning the carburetor won't get it going. Putting in a new battery doesn't help. You'll eventually have to repair the ignition wire, one way or another. You might kid yourself the wire wasn't really at fault by installing a whole new ignition system—but one way or another you're going to fix that wire before it runs again.

The immensely destructive riots in Los Angeles, Chicago, and other cities were not, at the start, primarily racial—they were mainly the young barbarians against the "police brutality" of authority that refused to grant them the absolute immunity they wanted.

Once started, it snowballed, and the older barbarians joined in happily. The true Vandal spirit was manifested in their delight in setting fires that burned out whole blocks of property. They were revolting in search of "freedom now" in one sense—freedom to do what they damned well pleased, with no punishment threats, with total immunity.

Ninety per cent of the Thoughtless Liberals' excuses for the JD, and for the arrogant defiance of law by many of the Negro "Civil Rights" groups, has been based on arguments about how terrible it is to grow up in a ghetto—that such crowding and dirty conditions inescapably breed crime. That it isn't the fault, or the responsibility of the colored people, but the natural consequence of such conditions.

That, my friends, is absolutely one hundred per cent obvious nonsense. It is totally wrong, and strictly propaganda guff.

The simplest evidence is directly available in almost all of our great cities. It isn't a matter of how terrible it is to be physically marked by skin-color, either.

Take a look at the other "ghetto" of colored people you'll find in almost every major U.S. city. A ghetto densely populated by colored people who didn't have a Chinaman's chance, after they were imported to this country for heavy labor at starvation wages, for domestic servants, and the like. People marked by differently shaped features and by skin color, demeaned and rejected, crowded now into city ghettos.

No Civil Rights movements have sought to better their lot. Their schools have not been integrated—and until pretty recently, the White culture didn't offer their children much schooling anyway.

But the Chinese sections of our large cities, just as densely crowded as the Negro sections, will never be confused with them. In New York City, for instance, Chinatown doesn't remotely resemble Harlem. It's one of the cleanest sections of the city—and it has the lowest crime rate of any section. The crime rate there is lower than it is

continued on page 157

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Part I of II.
The United Planets weren't very united—but the Cloak & Dagger division had a most bodaciously good reason why they had to be! It was rabbity looking—but very dead, half-burned, and obviously alien intelligence!

BEEHIVE

BY MACK REYNOLDS

Illustrated by Kelly Freas

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Supervisor Sid Jakes was in fine fettle. As his men inspected the papers of the VIPs at the door and finally ushered them into the highly guarded room, he took over and pleasured himself in presenting the exhibit.

The exhibit was in a square box which resembled a combination coffin and deep freeze, which is exactly what it was. The exhibit itself was a small charred creature about the size of a monkey or rabbit. However, signs of clothing or harness could be made out and what would seem to be side arms.

The routine went almost identically with each visitor. At the door, Ronny Bronston, or one of the other Section G operatives, would finish the identification and call out such as, "Sidi Hassen, Hereditary Democratic-Dictator of the Freewealth of the Planet Medina."

The ruler of Medina would come forward, invariably blank of face, and with a gesture, as though presenting his most valued possession, Sid Jakes would indicate the exhibit.

The Section G agents present had come to expect the same initial reaction, each time.

It was, "What is it?"

Sid Jakes would grin happily, but hold his peace.

The VIP, his eyes probably bugging by now, would say, in absolute astonishment, "Why, it's an alien life form!"

The sharper ones would sometimes say, that first time, "It's an *intelligent* alien life form."

Supervisor Jakes let them remain long enough to realize the full significance of the badly burned, deep-frozen carcass, then, invariably stemming a flow of questions, would usher the VIP to an opposite door where other Section G operatives took over.

The secret room cleared, they would begin all over again.

"His All Holiness, Innocency the Sixteenth, Presidor of the Holy Theocracy of the Planet Byzantium."

His All Holiness would step forward and gape in turn at the charred body of the tiny creature. "It's an intelligent alien life form! But there *is* no intelligent life in the galaxy, save Created man!"

There was only one break in the routine.

Ronny Bronston had been standing to one side while his two companions guarding the door processed the latest arrival.

One of them began to say, "The Supreme Matriarch Harriet Dos Passos of the Planet . . ."

Ronny snapped, "She's a fake!"

The newcomer darted in the direction of the freezer box which contained the alien carcass, yelling, "I've got a right . . . !"

Ronny put out a foot, coldbloodedly, and the other went down, arms and legs going every which way.

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"Sorry, Lady," he said. "Admission is by invitation only."

"Get her, boys!" Sid Jakes snapped, coming forward quickly himself. Ronny and the other two grabbed for the intruder.

But that worthy was made of sterner stuff than they had assumed. She rolled, bounced to her feet again and scrambled toward the freezer.

She stared into its interior, eyes bugging as all eyes had bugged that morning. Finally she turned and faced them, her expression unbelieving, as all expressions had been unbelieving. She turned to face four cold faces, four leveled Model H hand weapons.

Sid Jakes' voice held its usual chuckle, but there was a deadly frigidity in it now. He said, "If she makes one move, any move at all, muffle her." He grinned at the intruder. "That was bad luck, for you, the fact that you managed to see it, you silly flat. Do you think we'd go to this much security if it wasn't ultra-important? Now let's have it. You're obviously not Harriet Dos Passos. Who are you, how'd you get here, and who sent you?"

The other snapped, her voice not as yet shaky, "I'm Rita Daniels, from Interplanetary News. That's the corpse of an intelligent alien life form in there. I'm not stupid. There isn't supposed to be other intelligent life in the galaxy. Our viewers have a right to know what's going on here in the Commissariat of Interplanetary Affairs. United Planets is a democratic . . ."

Sid Jakes interrupted, grinning still, "You'd be surprised, my stute friend. Now, once again, who sent you?"

"My editor, of course. I demand . . ."

Sid Jakes made a gesture with his head at one of the Section G operatives. "Terry, take her over to Interrogation. Use Scop . . ."

The newshen bleated protest which was completely ignored.

". . . To find out the names of every person who might remotely know about this romp of hers. The editor, possibly her husband if she has one, the editor's wife, secretaries, fellow reporters, absolutely everybody. Then send out men to round up every one of these. In turn, put them on Scop and get the names of everyone that they might have mentioned this to."

"How far do we follow it, Sid?" the agent named Terry said.

Sid Jakes laughed wryly, "To the ultimate. Even though you wind up with everybody in Interplanetary News in Interrogation. We've got to have everybody who even suspects, or might possibly suspect, the existence of our little friend, here." He made a gesture with a thumb at the alien in its box.

The agent nodded, then asked one last question. "After interrogation, what?"

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Sid Jakes said flatly, "Then we'll have to memorywash her. Completely wash out this involved period, no matter how far back you have to go."

The newswoman shrilled, "You can't do that! Under United Planets law, I've got . . ."

Ronny Bronston shook his head at her. "You're not in the hands of United Planets, in the ordinary sense of the word, girl friend. You're in the hands of Section G."

"But you're a section of the Bureau of Investigation, Department of Justice of the Commissariat of Interplanetary Affairs! I have my rights!"

Sid Jakes didn't bother to argue. He said to his other operative, "Get about it, Terry. This is bad. On your way over to Interrogation, if she makes any attempt to break away, muffle her, but tune your gun low. We don't want her out for too long. She probably had no idea what she was looking for when she broke in here. Somewhere there was a leak, we've got to find the source of her knowledge that something was coming off. But above all, we've got to prevent her from spreading what she saw."

Terry said, "Right, Sid. Come along, my stute friend, and you heard the Supervisor. One wrong move and you're muffled, and, believe me, it hurts."

Rita Daniels' last protest, as she was marched out the door she had entered, shrilled back over her shoulder, "You . . . can't . . . do . . ."

"Famous last words," Sid Jakes grinned at his two remaining men. "Come on boys, let's finish. There are only a few more to go." He looked at Ronny approvingly. "That was a neat trick. How did you spot her?"

Ronny snorted deprecation. "She was too romantic. She was wearing make-up disguise, probably in attempt to resemble the real Matriarch. She'd have been better off altering the Tri-Di identification portrait in the credentials. We have no record of what the real Dos Passos looks like. She just recently came to office."

They processed the remaining VIPs, then sealed the secret room and put it under armed guard.

Sid Jakes and Ronny Bronston, one of his favorite field men, went on to the conference hall where they had been sending the viewers of the exhibition.

"Where's the Chief?" Ronny said. He was what could only be described as a very average man. It was one of his prime attributes as a Section G operative. He was of average height and weight. His face was pleasant enough, though hardly handsome and you had to have seen it several times over before you were apt to remember this somewhat colorless young man of about thirty. He was less than

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natty in dress and his hair had a slightly undisciplined trend. He was dark of hair and brown of eye and he absolutely never stood out in a crowd.

He was also as devoted an agent as was to be found in Section G, whose personnel was selected on the basis of devotion to the United Planets dream.

Sid Jakes, walking along beside him—bouncing along, might be the better term—couldn't have been more different. Even his clothes breathed a happy-go-lucky air. He had a nervous vitality about him that made all others seem lazy of movement. But his appearance was as belying as that of Ronny Bronston; one does not achieve to the rank of supervisor in Section G without abilities far and beyond usual.

Sid said, grunting amusement, "The Old Man's in hiding until the time comes for the big revelation. He's not about to get into that hive of big shots and let them yell at him at random. I'll have Irene give him the word when all's ready."

The selected men of importance of United Planets had been gathered in an Octagon ultra-security conference room which had been adjusted to hold the full two thousand of them. Comfortable seating arrangements and refreshment, both food and drink, had been provided. However, there was absolutely no method by which any, no matter of what importance, could communicate with the outside. It is wild understatement to say that there was complaint about this.

The doors were guarded by empty-faced Section G agents, obviously under most strict orders. Polite they were, when this president or that dictator, this scientific genius, or that head of a fanatic religious system, demanded exit or some manner of communicating with family or staff. Polite they were, but unbending. When a burly bully-boy from the feudalistic planet Goshen tried to be physical, a short scuffle was sufficient to demonstrate that Section G training included hand-to-hand combat—in spades.

Irene Kasansky was seated, efficient as ever, at a desk near the podium. She was answering questions, briskly issuing commands into her order box when requests involved some matter of preferred refreshment or other minor matter which didn't interfere with the security of the meeting.

There comes a time, Ronny Bronston thought all over again, when automation falls flat and man returns to human labor—in this case, the ultra-efficient office secretary-receptionist. Spinster Irene Kasansky, on the verge of middle age and unfortunately plain, was also by far and gone the best secretary in the Octagon.

Now she snarled from the side of her mouth, "It's about time you got here. I've been through more

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jetsam this past few hours than I have in the past few years managing Ross Metaxa's office. And I thought that was the ultimate. Where have you been, playing dice?"

Sid grinned down at her. "Don't be bitter, dear. You'll get wrinkles and an acid-looking face, and then everyone will stop propositioning you. All's ready to go. Pry the Old Man away from that bottle of Denebian tequila of his and let's let loose the dogs of war."

He turned and bounded to the speaker's stand. Holding up his hands, he called, "Gentlemen, gentlemen, ladies, ladies. Can we all be seated? The meeting is to commence."

He held silence then until all was quiet, which took some holding, considering the fact that possibly the most highly individualistic persons in United Planets were gathered before him.

Sid Jakes grinned finally, as though finding the whole thing amusing and said, "Undoubtedly you have been spending the better part of the morning discussing among yourselves the significance of the little creature I displayed to you. But now we shall hear from Commissioner Ross Metaxa."

"Who in the name of the Holy Ultimate is Ross Metaxa?" someone rumbled.

And someone else snapped, indignantly, "You have taken *His* name in vain!" The latter worthy was dressed in colorful and flowing robes.

"Please, gentlemen, please," Sid shouted above again rising voices. "Commissioner Ross Metaxa!" He jumped down from the dais and grinned at Ronny.

"The Old Man can have this job," he chortled. "Every crackpot genius in this section of the galaxy is out there."

Ross Metaxa came in through an inconspicuous door in the rear of the room, immediately behind the speaker's stand. Eyebrows went up. He was flanked by the Director of the Commissariat of Interplanetary Affairs, as high an office as United Planets provided, and by the President of United Planets, a largely honorary office filled by interplanetary vote once every ten years, each member planet being entitled to one voice. Metaxa did not seem to be awed by his companions but rather was obviously accompanied by peers.

Sid chuckled from the side of his mouth. "The Old Man's hanging it on heavy."

"He knows what he's doing," Ronny whispered back. "He's going to have hard enough a time as it is, getting this assembly to listen to his opinions."

The Director and the President took chairs off to one side and Metaxa made his way to the podium. He was a man in his middle years, acid sour of expression, going a bit to weight around the

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waist, sloppy of clothing to the point where it would seem an affectation.

The voices of the two thousand had begun to rise again, questioning, querulous.

Ross Metaxa glowered out at them for a long moment. Finally he growled, "Let's cut out all this jetsam and get down to matters."

There was an immediate hush of shocked surprise.

Before an indignant hum could rise again, the Commissioner of Section G announced brusquely, "Ladies and gentlemen, to use an idiomatic term of yesteryear, the human race is in the clutch."

II

Someone in the first row of the audience snorted ridicule and called up, "Because of that little creature in there? Don't be a flat!"

The Commissioner of Section G looked at him bleakly. "It should occur even to the physically conscious Grand Duke of the Planet Romanoff that the size of the creature in question has nothing to do with it." He tapped his head significantly. "It is what is in here that brought us up short. You see, the little fellow was picked up by one of our Space Forces scouts well over a century ago."

"A century!" one of his listeners bleated. "And we are only informed today?"

A buzz began again, but Metaxa held up a weary hand. "Please. That is one of the things I am here to explain. Our little alien was found in what could have only been a one-man fighter scout. He was dead, his craft blasted and torn, obviously from some weapon's fire. His own vessel was highly equipped with what could only have been weapons, most so damaged our engineers have yet to figure them out. To the extent they have been able to reconstruct them, they've been flabbergasted.

"The conclusions are obvious. Our intelligent alien, in there, was killed in an interplanetary conflict. How long he had been drifting in space, our technicians couldn't determine, possibly only for months, but possibly for any number of centuries. But the important thing is that there was at least one other warlike, aggressive life form in the galaxy besides man. Probably at least two, since it was interplanetary war which killed our specimen."

The buzz rose again, and was not to be silenced for a time. Ross Metaxa stood and waited it out. But they were anxious for his revelations and finally silence ruled.

He dropped another bomb.

"But we no longer need fear our friend in the other room. Man is in no danger from him and his species."

That set them off once more, but he held firm in silence until they quit their shouting of questions,

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their inter-audience squabblings, chattering and debate.

At last he held up a hand and said, "Let me leave that statement there for the time. Let me lay a foundation upon which to base what we must discuss today."

He looked out at them, thoughtfully. "Most of you are going to have some reservations about what I have to say." He shrugged.

"Fellow citizens of United Planets, when man first began to erupt into the stars, but a few centuries ago, it assumed a form that few could have foreseen. All but lemming-like he streamed from the planet of his origin. And the form his colonizing took soon lost all scheme of planning, all discipline. The fact was that any group that could float the wherewithal to buy or rent a space transport, or convert a freighter, could take off into the stars to found their own version of Utopia.

"And take off they did, without rhyme or reason. No, I recall that statement. Reasons they had aplenty. Racial reasons, religious reasons, political reasons, idealistic reasons, romantic reasons, socio-economic reasons, altruistic reasons and mercenary reasons. In a way, I suppose we duplicated, a hundredfold, the motivations the Europeans found to colonize the New World. The Spanish came with sword and harquebus in search of gold, ready to slaughter all who stood before them. The Pilgrims came to seek a new land where they could practice a somewhat stilted religion, in a manner denied them at home. Large numbers of criminals came, either as convicts being exiled or fugitives from justice. Adventurers of every type zeroed-in seeking their fortunes. Later, large numbers of Germans came, fleeing political persecution, and large numbers of Irish, fleeing famine."

Ross Metaxa grunted, and flicked his heavy head. "And so it was in space. And in the early years, in particular, there was comparatively little friction. The galaxy is immense and thus far we have but touched the slightest segment of it. We are way out in a sparsely populated spiral arm, but there are still inhabitable planets in vast multitude and room for all. Every spacer load of idealists or crackpots could safely find their habitable planet and settle down to, ah, go to hell in their own way."

There was a mumble of discontent over the manner in which he was expressing himself, but he went on, ignoring the toes being stepped upon.

"However, in time some of our more aggressive planets began to have growing pains. Planets settled by such groups as the Amish, began to worry about their neighbors on the Planet Füehrerland, which had been settled by a disgruntled group of followers of a political leader of the Twentieth

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Century, who had come to disaster in his own time, but whose tradition came down through the years, somewhat distorted in his favor, as traditions are apt to become. Suffice to say that United Planets, based here on Mother Earth, came into being. Its purpose, of course, was obvious. To assist man in his explosion into the stars. The very basis of the organization was Articles One and Two of the United Planets Charter. Citizeness Kasansky, please."

Irene Kasansky, without looking up, read into her desk mike. "Article One: *The United Planets organization shall take no steps to interfere with the internal political, socioeconomic, or religious institutions of its member planets.* Article Two: *No member planet of United Planets shall interfere with the internal political, socioeconomic or religious institutions of any other member planet.*"

Ronny Bronston knew, even as she read, that not only Irene, but everyone present in the hall knew the articles by heart. Metaxa was simply using this bit of business to emphasize his fling.

When she was done, Metaxa nodded ponderously. "Over the centuries, most planets, though not all, have joined up. Whatever their stated reasons, usually very high-flown ones, the actuality is that each wishes the protection of the Charter. Each planet desperately holds on to its own sovereignty."

There was a buzz again, and again he ignored it.

"Always remember that within our almost three thousand member planets are represented just about every political and every socioeconomic system ever dreamed up by philosophers and economists since Plato, every religion since the White Goddess, the Triple Goddess, prevailed throughout the Mediterranean. A planet whose economy is based on chattle slavery doesn't want to have its institutions subverted by adherents of feudalism. And a planet with feudalistic institutions doesn't want some entrepreneur from a nearby planet flying the flag of free enterprise to come along with creeping capitalism. An atheistic planet, such as Ingersol, doesn't want a bevy of fanatical missionaries from Byzantium, working away at its youth which hasn't been exposed to religion for centuries."

His All Holiness of the Holy Theocracy of the Planet Byzantium called out in a fine rage. "I protest your levity, Commissioner."

Ross Metaxa ignored him.

"All this is not new to you. But somewhat over a century ago, matters changed, overnight and drastically. Our Space Forces brought in our little alien, there in the next room. Suddenly we had to face it. Man is not alone in the galaxy. Nowhere, in our explorations,

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though admittedly they have been but a pinprick on the chart of the Milky Way, did we find signs of intelligent life. Lower life forms, yes, occasionally. But never intelligent life of, say, even the order of the chimpanzee of Earth. But now we had to face the fact that there is intelligent, aggressive, scientifically and militarily advanced life in our galaxy, and, obviously, sooner or later, man, in his expansion into the stars, will come up against it. It was but a matter of time."

Someone called out. "Perhaps this life form is benevolent!"

Ross nodded his shaggy head. "Perhaps it is," he answered simply.

His words brought a deep silence. These were not stupid men and women. Largely, they were the cream of the planets they represented. The inference was obvious.

Ross Metaxa dropped another bomb. "So it was," he went on, "that the nature of United Planets changed. Unbeknownst to the individual member planets, a new purpose for its being evolved."

There was heavy electricity in the air.

"No longer was it practical for man to allow such groups as the naturalists, who colonized the Planet Mother, to settle into their desired Stone Age society, rejecting all of man's scientific advance down through the ages. No longer could we condone the presence among our number of the Planet Kropotkin, based on the anarchist ethic that no man is capable nor has the right to judge another. No longer were planets such as Monet to be borne."

"Monet?" someone shouted in query.

Ross Metaxa said, "Originally colonized by a group of artists, musicians, painters, sculptors who had visions of starting a new race devoted entirely to the arts. They were so impractical that they crashed their ship, lost communication with the rest of the race, and when rediscovered had slipped into a military theocracy something like the Aztecs of Mexico. Their religion was based on that of ancient Phoenicia, including child sacrifice to the God Moloch. Monet, too, claimed the benefits of Articles One and Two, wishing no interference with their institutions."

The representative from Goshen, the bully-boy who had had the run-in with the Section G guards earlier, lumbered to his feet. His voice was dangerous. "And what was this new policy adopted by United Planets, unbeknown, as you say, to the member planets themselves?"

The Commissioner made a gesture with a heavy paw. "Is it not obvious, Your Excellency? It became the task of United Planets, though but a fraction of us have been privy to the fact, to advance the human race, scientifically, in-

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dustrially, culturally, socioeconomically, as fast as it was possible to do so."

"Even though Articles One and Two, the very basis of the Charter were violated!"

The shaggy head lowered, and Ross Metaxa glowered out at them, in their shocked silence. "No matter *what* was being violated," he growled.

A roar went through the hall and he waited it out.

At long last he was able to say, "Nothing could be allowed to stand in the way of the most rapid advance of which we were capable. Sooner or later, we knew, we would come in contact with the potential enemy. A potential friend, too, of course, but that must remain to be seen. Man must be as strong as possible when the confrontation takes place."

Sidi Hassen of the Planet Medina was standing. All eyes went to him. Medina was one of the strongest planets in the union, though his government was one of the most repressive.

He said, "Commissioner Metaxa, it is obvious that all this is but a buildup. You have admitted that Mother Earth, home of United Planets, has been secretly subverting the institutions of the member planets. Now tell us why it has been necessary to reveal the fact to us, at this late date." There was a dangerous element in his voice.

Sid Jakes chuckled under his breath and whispered to Ronny Bronston, standing beside him. "Our friend has probably just realized where some of his Underground troubles originated. If the boys have been briefing me correctly, that Hereditary Democratic-Dictatorship of his isn't going to last the week out."

The head of Section G nodded agreement. "Very well," he said. "As I mentioned earlier, the charred body you were all invited to see no longer indicates a threat to us." He paused, wanting the drama.

"Why not!" came from a hundred voices.

"Because a few weeks ago a small exploration task force, driving out beyond the point thus far ventured to by even the most adventurous of our race, came upon the three star systems which were the origin of our little dead space traveler."

"You mean," the burly representative from Goshen roared, "that we now know where the sneaky little rats come from and they only dominate three star systems?"

Metaxa nodded. "From all we can find, they had evidently spread over a complex of some twelve planets. Planets similar in nature to those that will support our own life form. Our little aliens were also oxygen breathers." He grunted and flicked his head in his dour, characteristic mannerism. "I see

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most of you have noted my use of the past tense."

He dropped his last bomb. "Our exploring fleet found that each of their twelve planets were now supporting a methane-hydrogen-ammonia atmosphere. They found also that evidently the switch in atmospheres from one predominately nitrogen-oxygen, had come so suddenly that the inhabitants had no time to attempt protection. They died. Perhaps some survived for a time, including those that might have been in space when the atmosphere switched. If so, it would seem they were destroyed by other means. Perhaps our specimen in the other room was one of these. At any rate, ladies and gentlemen of the human race, this whole life form has been completely destroyed by some other intelligent alien life form beyond it." He looked about the large hall with its some two thousand rulers of the member planets. "That, by the way, should be at least a partial answer to the question of whether or not this life form still further beyond can be considered benevolent."

There were a hundred questions being roared at him. He ignored them, largely, trying to answer a few that seemed more pertinent.

Someone called, "Where was this discovery of the three-star systems made?"

Metaxa said, "Surprisingly near our member planet of Phrygia, which, of course, is the furthest from Mother Earth in the direction of the galaxy's center."

Irene Kasansky turned to Sid Jakes and said, "Terry wants to talk to you." She handed him a Section G hand communicator.

Sid spoke into it, his eyes darting around the crowded conference room even as he spoke.

He snapped, "All right, I'll be right over." He handed the communicator back to Irene and said to Ronny Bronston, "Come on Ronny. They're going to be yelling back and forth in here for hours."

Out in the corridor, Ronny said, "What's up?"

The supervisor summoned a three-wheeler. "Terry's cracked that newshen Daniels, or whatever her name is. Metaxa doesn't need us for a while. Let's see what she has to say. I magine that mopsy's gall, trying to crack Section G security."

They climbed onto the three-wheeler and Sid Jakes dialed Interrogation.

Ronny said mildly, "If you ask me, the woman's pretty stute to have got as far as she did. We ought to recruit her."

"Sure, sure," Sid Jakes laughed. "She'd stay with us for a year or so, until she knew every secret in the Commissariat, then go running back to Interplanetary News again. Once a newshound, always . . . Oops, here we are."

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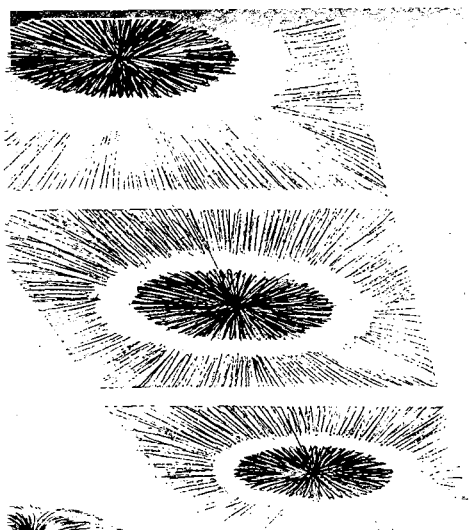

Interrogation had come a long way since the days of the Gestapo of the Third Reich, or even the cellar room with the bright light and the rubber hoses of the Land of Liberty.

Rita Daniels was sitting at her ease in a comfortable chair. Terry Harper was across from her. There was a low table with refreshments between them. Inconspicuously, in the background was a Section G stenographer, in case human witness was necessary.

Terry got up when his supervisor entered. He was an old-timer in the bureau, due soon for retirement which he didn't look forward to with glee.

He said, "Sid, as far as the girl knows, only her editor is aware she's here."

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While Ronny Bronston sank into a chair, Sid Jakes perched on the stenographer's desk. He said pleasantly to the newswoman, "And how did he find out something was cooking at the Commissariat of Interplanetary Affairs?"

The other's face worked under the pressure of trying to fight off the influence of the drug. "I don't know," she said.

Sid looked at Terry. "You sent a man over to the editor yet?"

"Not yet, Sid. Since so far as this one knows, only the editor is involved, I thought you might want to play it as stute as possible. If we don't have to throw weight around, well good."

Sid patted him on the arm, happily. "Good man, Terry." He spun on Ronny. "Get over to Interplanetary News . . ." He looked at Rita Daniels. "What's this editor's name?"

"Rosen. He's on the Octagon desk."

Sid's eyes darted back to Ronny. "Bring him over, but in such a way that no ripples are started in his office."

"Oh, great," Ronny said. "No ripples. Just sugar talk him into coming into our lair, eh?"

Sid Jakes grinned at him happily. "Ronny, old boy, if you can't do it ripplelessly, nobody can. You're the most inconspicuous man in the bureau."

"Is that supposed to be a compliment?"

III

The nadirscraper which housed Interplatetary News delved a good two hundred levels beneath the surface of Greater Washington. As was the prevailing trend, the face presented to the world of the open air was Antiquity Revival, in this case, Egyptian. Although Ronny Bronston had never been in the establishment before, he had passed it on many occasions, never failing to wince at the architect's conception of the Temple of Luxor.

Now he made his way up an immense approach flanked by a score of marble sphinges, through an *entrada* of soaring columns seemingly open to the sky but undoubtedly roofed with ultra-transparent plasti.

There was no point in being less than direct. He marched up to the reception desk, pressed an activating button before one of the live screens and said, "Bronston of the Department of Justice, Bureau of Investigation, to see Citizen Rosen of the Octagon Desk. Soonest."

The voice said, "Your identification, please."

Ronny Bronston brought forth a flat wallet and performed an operation which came down, unbeknownst to him, in all identicalness from a long past period of law enforcement.

He flashed his buzzer.

It was a simple enough silver badge which glowed somewhat

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strangely when he touched it with a finger. It read, merely, *Ronald Bronston, Section G, Bureau of Investigation, United Planets.*

"Than kue, Citizen Bronston. Please state your reason for desiring an appointment with Citizen Rosen."

Ronny said testily, "Bureau of Investigation matter of a security nature."

"Than kue . . ." the voice faded away.

Almost immediately a three-wheeler approached and its voice-box said, "Citizen Bronston. Please be seated."

He mounted the scooter and noted with mild surprise how quickly the pseudo-Egyptian decor melted away as soon as they had entered a ramp leading into the depths.

The three-wheeler took him first to a bank of elevators, plunged him an unknown number of levels, emerged and then darted into corridor traffic.

Ronny thought of Interplanetary News as an octopus which had spread over almost all the United Planets, and over many man-occupied worlds not affiliated with the confederation. Few indeed were the planets that could refrain from the fabulous news-dispensing service. Even those worlds such as Goshen, which was so tightly dominated by the feudalistic clique which suppressed it, kept the populous ninety-five per cent illiterate and took all measures to keep even the barest knowledge of what transpired on other planets from its people, subscribed. In that case, only the nobility had access to the information purveyed.

It reminded Ronny, as he thought, that some measures were going to have to be taken by Section G to overthrow that Goshen aristocracy. If the planet was ever going to get anywhere, the people were going to have to be given a shove out of the mire of class-divided society.

He wondered, vaguely, how many languages, besides Earth Basic, Interplanetary News had to deal with. A thousand? Probably, if dialects were considered. It seemed that a considerable number of the colonists who wandered off into space, seeking their Ultima Thule, made effort to devise a new tongue, or, at least, to revive a dead one. There must be a score of versions of Esperanto alone, out there in the stars, not to speak of such jerry-rigged artificial tongues as Ido, Volapuk, Lingua Internaciona, Lingvo Kosmopolita, Esperantido, Nov-Esperanto, Latinesce, Nov-Latin, Europan and what not.

The more closely a world identified with United Planets, of course, the more widespread the use of Earth Basic, but the worlds which attempted to keep aloof, usually for religious or socioeconomic reasons, could get so far removed that United Planets, as well as Interplanetary

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News, had to deal heavily through interpreters.

There even came to mind that far out world settled by deaf mutes. What was its name? Keller, or something. He wondered how they had come up with a name like that for a planet.

The three-wheeler came to a halt before a door.

"Citizen Rosen," its voice box said.

Ronny dismounted and the vehicle darted off into the corridor traffic.

He stood before the door's screen and said, "Bronston, to see Citizen Rosen."

The door opened and he stepped through and into the arms of two well muscled goons. They held him by his arms, pausing a moment as though waiting for his reaction.

Ronny mentally shrugged. It was their ball. Let them bounce it.

Both still holding an arm with one hand, they ran their other hand over him in the classic frisk. He didn't resist.

One leered as he touched under the Section G agent's left arm. "Ah, packing a shooter."

The other said, "Take it, Jed."

Ronny said mildly, "If you take that gun, without my deactivating it first, you're a dead man, friend."

The other's hand, which had been darting under his jacket, came to a quick pause.

Jed scowld. "Don't give me that jetsam. What d'ya mean?"

Ronny said reasonably, "It's a Model H, built especially for the Bureau of Investigation. It's tuned to me. Unless I, personally, deactivate it, anyone who takes it from me is crisp within seconds."

The two of them froze.

Ronny said mildly, "If it's as important as all that, suppose I deactivate it for you? And you can return it when I leave. I'm not here to hurt anybody."

"The boss said . . ."

"The boss is obviously a flat," Ronny said, still with an air of bored reasonableness. "Since when does the Bureau of Investigation send pistoleros around to deal with half-baked newsmen?"

One looked at the other. "The boss said . . ." he let the sentence dribble off.

The other said, his voice gruff, "O.K., give us the gun." Their hands dropped away.

Ronny took the gun from its quickdraw holster, touched a hidden stud and presented it, butt first. "Now, can we see this romantic cloddy, Rosen?"

Jed, at least, flushed. One leading, the other bringing up the rear, they passed through another door and into a quarter acre of office.

He, who was obviously Rosen, sat behind a desk.

He bent a sly eye on the Section G agent.

"So. The Department of Dirty Tricks, Section Cloak and Dagger."

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Jed put the gun on the desk. "He had this on him," he said, the implication being that they had wrested it away from Ronny in desperate fray.

Ronny said, "Look, you characters seem to have been taking in a lot of Tri-Di crime tapes, or some such. Why don't we cut out all this maze and get around to the reason for my coming over here. We could have simply summoned you, you know."

Rosen said nastily, "You could have summoned till Mercury turned to ice cubes. What's going on over there at the Octagon? What happened to . . ." He cut himself short.

"To Rita Daniels?" Ronny provided. "She's O.K. My supervisor asked me to come over and bring you around to discuss Rita and her assignment."

"Yeah? And then you'd have both of us, eh? Listen, Bronston, what's going on? Half the most important bigwigs in the system have been . . ."

Ronny said quickly, "I don't believe you really want to discuss this in front of the boys, here."

"Why not?"

"That's what my supervisor wants to talk to you about," Ronny said mildly.

The other stared at him. He was a smaller man, even, than the Section G operative, and there was a cast of perpetual disbelief in his eyes.

He said finally to his two goons, "Go over there to the far side of the room, but keep your eye on this fella. And don't let his size throw you off."

They went to the room's far end and leaned against the wall, assuming expressions of bored cynicism in the best TriDi crime-show tradition. Ronny wondered vaguely if it had ever been thus, down through the centuries. Did the bully boys and criminal toughs of Shakespeare's day pick up their terminology and mannerisms from watching the villans in plays and aping them? He was inwardly amused.

As yet, Rosen hadn't asked him to be seated. However, Ronny pulled up a chair across the desk from the other, his back to the two goons. He looked at the newsman.

"My supervisor wants to talk to you."

"Before he releases Rita, eh?"

There was a certain quality about the other's voice. Ronny assumed the room was bugged.

"I didn't say anything like that," he said, ever mildly. "Where did you get the idea we were holding Rita Daniels?"

"She hasn't returned."

Ronny shrugged. "Why couldn't she be out having a guzzle or two?" He brought a pen from an inner pocket. "Let me have a piece of paper, will you?"

Scowling puzzlement, the other pushed a pad over. He failed to

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notice that the agent, never departing from the standard motions a man makes when he is about to jot down an item, had depressed a small stud on the supposed writing instrument's side. He failed to notice the faintest of hisses, nor the almost microscopic sized dart that pricked into his hand.

Even as Ronny scribbled a note on the paper, Rosen, still scowling, absently scratched the back of that hand.

Ronny pushed the note over. It said, merely, *"Come along with me, Citizen Rosen."*

Rosen read it and flushed anger. "Do you think I'm drivel-happy?" he began. Then his face went infinitesimally lax, his eyes, lightly strange. Deep in their depths there seemed to be a trapped fear.

Ronny came to his feet. "Let's go," he said. "Citizen Jakes is waiting."

"Yes. Yes, of course," Rosen said emptily. He stood up also.

His guards reacted.

Jed blurted, "You ain't going with this funker, are you Boss? You said you expected him to pull some kinda quick one."

Ronny picked up his gun from the desk, reactivated it and slid it back into its holster. He picked up the note he had written and slipped it into his side pocket. Without looking again at the muscle men, he headed for the door, followed by the chief of the Interplanetary News Octagon desk.

Back at the offices of Section G, in the Bureau of Investigation branch offices, still leading, he pushed his way through to the office of Sid Jakes. The irrepressible Sid was sitting at his desk, legs elevated, feet messing up a half dozen reports that lay there.

The supervisor waved a hand in greeting. "Who's this fella?' ' he said happily.

Ronny growled, "You wanted Rosen. So here's Rosen."

Jakes peered at the small newsman. "What's wrong with him?"

"He's got a Come-Along shot in him."

"Holy Ultimate, Ronny. You know that's illegal. Interplanetary News will have you on a kidnap romp charge."

Ronny grunted. "Remember? You were going to give this cloddy and his girl Rita a memorywash. That isn't exactly part and parcel of the United Planets Charter either. But the one will wash out the recall of the other, so what's the difference? What's going on between all the bigwigs?"

Before answering, Sid Jakes flicked on his order box and said into it, "Irene, send me in an antidote Syrette for a Come-Along. O.K., O.K., I know you're busy." He leered. "But who else could I trust with Ronny's neck at stake?" He flicked the box off and turned back to his field man. "That old mopsy's sugar on you, you know."

"How's the Chief doing?"

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"The Old Man's still at them, hot and heavy. He's let them know the fat's in the fire now. That, willy-nilly, they're going to have to get together in an all out co-operation, through United Planets, to meet the danger of these new aliens. It's a madhouse."

Sid looked at Rosen. "Sit down, fella. You look tired."

The terror was in the depths of the other's eyes. The wild desire to escape.

Ronny said, "He's tuned to me, of course." He said to the newsman. "Sit down, Rosen."

Rosen sat down.

Sid Jakes flicked his order box again. "Send Terry Harper over with a charge of Scop."

Ronny said wryly, "Our friend here is going to look like a pincushion before we're through with him, what with Come-Along and its antidote, Scop, and its, and then the memorywash."

There was fear and hate in the depths of the eyes again.

Later, shots administered, they sat around, Jakes, Bronston and Harper and stared at the Interplanetary News man, freed of the kidnapping drug now, but loaded with Scop.

Sid Jakes grinned at him, as though forgivingly. "Now, my stute friend, how many others, besides you and this Rita Daniels, knew about her assignment to break in on the UP conference?"

The other was trying to fight and couldn't. He tried to hold back each word, and couldn't.

"Nobody . . . except . . . my informant."

Sid nodded encouragement. "All right. And who told you about the meeting at all?"

"Baron Wyler."

Sid looked at Ronny and Terry. "Who's Wyler?"

Rosen took it as a question directed at him. "Baron Wyler, Supreme Commandant of the Planet Phrygia."

"Phrygia!" Ronny blurted. "That's the planet nearest to the alien threat. The Space Forces expedition that found the three star systems where the little aliens came from, took off from Phrygia as its final base."

Sid Jakes chuckled. "Now we're getting somewhere." He bent a cheerful eye on his victim. "And why did the good Baron tell you about the meeting?"

"I . . . I'm not . . . sure. I think . . . it's because . . . he gives us . . . news beats . . . available to him . . . as result . . . of his high . . . office. We . . . support . . . his politics . . . on Phrygia." There were blisters of cold sweat on the little man's forehead and his shirt was soaked, but his efforts were valueless. There was hate rather than fear in his eyes now.

"I see," Jakes drawled. "which would come under the head of interfering with the internal political

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system of a member planet of United Planets, eh? Naughty, naughty, Rosen. Violation of Article Two. Interplanetary News could lose its license to operate on an interplanetary basis. My, wouldn't your competitor, All-Planet Press just love that?"

But in spite of the levity of his words, his eyes were bleak as he spun to his order box. "If that yoke, Baron Wyler, would break ultra-security to tip off a newsman, who knows who else he might sound off to?" He flicked a switch and blatted, "Irene, have the boys pick up Baron Wyler of the planet Phrygia and bring him here. Absolutely soonest. Kid gloves, he's a chief of state."

The order box squawked a reply and Sid Jakes winced. "All right. Find out soonest where he's staying and send the boys to get him."

He turned to Bronston and Harper. "It's the most delicate situation that's come up in the history of the UP. We've got almost three thousand member planets but the leaders of only two thousand were let in on the crisis. If the word gets out to some of these more backward, reactionary or crackpot worlds that they were ignored and that their internal matters have been messed with, they'll be dropping out of United Planets like dandruff."

"What happened?" Ronny said.

Sid Jakes grumbled deprecation. "The conference has knocked off for the day and the delegates have melted away into their various embassies, to hotels, or to the homes of friends. The Holy Ultimate only knows where the Baron is. It'll be a neat trick finding him if he doesn't want to be found."

IV

When Ronny Bronston came in, in the morning, Irene Kasansky looked up from her desk, saw who it was and said, in comparatively good humor, "Where've you been, Ronny? The commissioner's been asking for you."

Ronny said mildly, "I've been getting some sleep. Remember? Even Section G operatives have to do it occasionally."

She snorted, but not with her usual acidity. "Jetsam, jetsam. All I get around here is jetsam. Why I don't go drivel-happy . . ."

Ronny grinned at her, pushed through the door beyond her desk, turned left in the corridor and knocked at another door which was inconspicuously lettered *Ross Metaxa, Commissioner, Section G.* Ronald Bronston seldom entered here without the realization coming over him, all over again, that behind this door was possibly the single most powerful man in United Planets, and that not one person in a million had ever heard of him. Ross Metaxa of Section G, the ultra-secret enforcement arm of the inner-workings of United Planets.

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Section G whose unstated principle was that the ends justified the means, that any means necessary to achieve the United Planets dream were acceptable. As always, when this thought came to him, Ronny Bronston shook his head. He had been raised in another ethic.

By his appearance, one would have assumed that the commissioner of Section G had not seen his bed the night before. Either that, or he had been on a monumental toot. He was red and slightly moist of eye, his clothes more disheveled than before. He looked up grumpily when Ronny entered.

Sid Jakes was there, too, sprawled in a chair, his hands in his pockets, his face in its all but perpetual grin. Lee Chang Chu was also present, sitting demurely to one side of Metaxa's desk, her *cheongsam* dress emphasizing her oriental background.

Metaxa grunted. "Ronny. Good. We're just about to get underway. Drink?" He made a motion to the inevitable squat bottle that stood at his right hand.

Ronny shuddered. "That stuff? And this time of day?" He looked at the girl. "Hi, Lee Chang." So far as he knew, every unmarried man in Section G was in love with the diminutive Chinese girl, despite the fact that she was possibly the most effective agent of them all and had reached supervisor status, ranking the great majority.

She smiled her slow smile and nodded her greetings, as though too shy to speak out in this gathering of men.

Metaxa grunted, "Sid, bring Ronny up to date."

Sid chuckled happily. "Everything's going to pot. Whether or not we're going to keep the lid on this, even temporarily, is moot. We thought we'd selected the two thousand most responsible chiefs of state of United Planets. Actually, what we've got is a madhouse. Hardly any two of them agree on what's to be done. At least a dozen have dropped out of UP."

Ronny stared at him. "Dropped out! But why? In this emergency we must . . ."

Metaxa interrupted long enough to growl, "They didn't wait long enough to consider the emergency. As soon as they heard that we had been violating Articles One and Two, they resigned."

Lee Chang Chu spoke for the first time. She said softly, "Self-interest we shall always have with us. There's a sizable percentage of our species that would rather die, and bring down the whole race with them, than face the threat of having their political or religious institutions changed."

There was no refuting of that.

Sid went on. "Goshen and some of the other hairy-chested planets want to declare war on the aliens. Right now." He laughed his pleasure at the idea. "We don't even

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know where they are located in the galaxy, but Goshen wants to declare war. On their own planet, of course, they've resisted the introduction of gunpowder. Afraid that the serfs they exploit might get uppity if there were weapons available capable of knocking over castle walls. But they want to declare war on some unknown aliens who evidently have the neat trick of changing a whole world's atmosphere from nitrogen-oxygen, to what amounts to poison gas, overnight. Oh great." Sid chortled again.

"Get on with it, you laughing hyena," Metaxa grumbled.

Sid said, "Others want to sue for peace. How we can sue for peace is another mystery, always keeping in mind that even if we knew where they came from, we still have no particular reason to believe we could communicate. Or, if we could, that they'd be interested in doing so. But even that's not the end. A few of the member planets want to send missionaries. Missionaries, yet! If there's anything that'll irritate just anybody at all, it's bothering around with his religious institutions. Besides, who ever heard of missionaries being sent from a weaker to a stronger power. It's the stronger power that always beats its weaker neighbors over the head with its missionaries."

Ronny said, thoughtfully, "What is our own stand? Section G has been aware of the problem for over a century. What *should* we do?"

Metaxa stirred in his chair. He growled, "For the most part, what we have been doing. That is, speeding up our own development by every means that we can. Scientifically, industrially, socioeconomically . . ."

Ronny frowned at him.

His chief scowled back. "We've got to push toward the optimum socioeconomic system . . ."

Ronny said mildly, "There are nearly as many ideas on what that is as you've got persons who have considered the question."

Sid chuckled.

Metaxa growled, "Please, no humor at this time of day. So far as we're concerned, the optimum social system is one under which the greatest number can exercise the greatest amount of each individual's ability. As much education as the individual can assimilate, all out encouragement of unusual gifts, absolutely nothing so silly as industrial production cycles that allow such nonsense as unemployment, not to speak of anything as reactionary as featherbedding."

Lee Chang Chu said softly, "It is an optimum which has been realized on few planets, I am afraid."

The commissioner said, "At this point, we are aware that our potential enemy exists, though we are not in contact. But we haven't any reason to believe that he is aware

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of *our* existence. It is possible that we have another year, another century, another millennium before our cultures touch. Possible, but not probable. To the extent we can delay that meeting, we can be more happily prepared for it. That's our job. Delay, delay, delay, while man continues to advance." He looked at Ronny again. "And that's where you come in."

Ronny Bronston was taken aback. "What?"

Sid chuckled his amusement.

Ross Metaxa reached his hand out for his Denebian tequila, saying to Lee Chang, "You're the only one of us that's been to Phrygia. Brief Ronny on the place. That's why I called you in."

Lee Chang nodded demurely. "Are you acquainted with the derivation of the planet's name, Ronny?"

"I don't believe so."

"It was one of the early Greek states. Myth has a story about one of its kings, a cloddy named Midas who had an abnormal love of gold. He befriended Silenus . . ."

Sid put in, "I know that one. The god of drunks."

Lee Chang looked at him from the side of her eyes and went on. "And as a reward Dionysus gave him one wish. He chose the power to turn everything he touched into gold." She twisted her mouth in gentle mockery. "The ramifications are obvious."

She looked at Ronny again. "The name has a certain validity. Phrygia, I mean. The original colonists were a group which rebelled against the growth of what was then called the Welfare State. They were even more emphatic than usual. Many planets have been colonized by elements strong for, ah, free enterprise and opposed to any interference at all by the state in the management of business, not to speak of democratic ownership of the means of production, distribution and communications. The colonists of Phrygia didn't even believe in common ownership of such things as the post office and highways, not . . ."

Ronny blinked at her. "How can you conduct a post office or . . ."

Sid chuckled. "Ronny, old man, you don't go far enough into history. Don't you remember the Pony Express and Wells Fargo? In the early days, mail was in the hands of private concerns. And quite a hash they made of it, too. And early toll roads and toll bridges were private, too."

"At any rate," Lee Chang went on, "the settlers of Phrygia were strong individualists and great believers in pragmatism. On Phrygia, it's each man for himself and the devil take the hindmost."

"Also," said Sid, "dog eat dog, never give a sucker an even break, and if I don't take advantage of this situation, somebody else will." He laughed.

Lee Chang said thoughtfully,

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"The characteristic also manifests itself in their interplanetary relations. The Phrygians are great entrepreneurs, great traders. More than once, less advanced member planets have had to evoke Article Two of the UP Charter to avoid being swallowed up, economically speaking, by the stutes from Phrygia." She allowed herself a slight smile. "I suspect that actually they are in considerable revolt against the existence of such a restraint. Given a free rein and Phrygia would be in full control of a considerable section of her part of our growing confederacy in short order."

When she paused, Ronny looked at his superioor. "What's this got to do with me?"

Metaxa had slugged back the drink he had poured. Now he said, even as he wiped the heel of his beefy hand over his mouth, "Sid didn't bring you completely up to date. Yesterday, when we found out it was Baron Wyler who had tipped off Interplanetary News, we sent out a call to have him picked up. Until we are able to concoct some mutually satisfactory plans to present to United Planets as a whole, we want to keep the existence of the aliens secret in order to minimize confusion. However, the good Baron has flown the coop."

Ronny stared at him. "He's gone? Where?"

"Evidently, back to Phrygia. He came to the conference in his own official yacht. Which is, by the way, at least as fast as any Space Forces cruiser, or public transportation. You won't be able to beat him back to his home planet, no matter how soon you start."

It was clearing up now. Ronny looked from one of them to the other. "You want me to go to Phrygia, eh? What do I do there?"

Ross scowled at him. "If we knew, then we wouldn't have to send as good a man. You play it by ear. Do what has to be done."

Ronny grunted at the left-handed compliment. "How big is our Section G force on Phrygia?"

Metaxa looked at Sid Jakes.

Sid was amused. "Only one man," he said. "And he's incognito. Operates under the guise of a member of the UP Department of Trade. The Phrygians are as stute as they come and evidently suspect the true nature of Section G. They don't want any of our operatives stirring around in their affairs."

Ronny came to his feet. "I suppose I'd better get going." He hesitated. "What happened to Rita Daniels and Rosen?"

Sid shrugged. "We memory-washed them and sent them back to Interplanetary News. They can't complain. They've been violating Article Two in return for news beats."

Irene Kasansky had made the arrangements for his trip out to Phrygia. When he issued forth from

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Metaxa's sanctum sanctorum, she had looked up at him from her multiple duties on phone screen and order box, at desk mike and auto-files.

"Got your marching orders, eh? Before they're through in there there won't be an agent left on Mother Earth." She handed a slip of paper to him. "Your shuttle for Neuve Albuquerque leaves at six. You'll have only one hour stopover. It's all on the paper there. Take care of yourself, Ronny."

It occurred to him only then why Metaxa and Jakes had sent but one agent to Phrygia. Section G must be impossibly short of men in this crisis. Metaxa must have a thousand sore spots with which to deal. He had been right, up there on the podium, man was in the clutch and must soon alter all his most basic institutions or he would be a sitting duck for the ultra-advanced aliens.

Ronny Bronston packed sparsely. He had no idea of how long he might remain on the distant planet which was his destination. It might be a matter of hours or years; he might spend the rest of his life there. However, if the stay was lengthy, he could augment his possessions on the spot. To date he had no idea of what Phrygia climate or clothing styles might be. Why overload himself with non-essentials?

The roof of his apartment building was a copter-cab pickup point and it took him little time at all to make his way to the Greater Washington shuttleport. Within three hours of his exit from Ross Metaxa's office, he was being lobbed over to the spaceport at Neuve Albuquerque.

Irene had made him reservations on an interplanetary liner, rather than assigning a Space Forces cruiser. More comfortable than the military craft, of course, but not so fast. He shrugged. It was a long trip, and one to which he didn't look forward.

When Ronny Bronston had been a younger man, working in Population Statistics in New Copenhagen, had someone suggested that he wouldn't enjoy interplanetary travel, he would have thought the other mad. Getting into space was every Earth born boy's dream, and few there were who realized it. Long since, the authorities had taken measures to keep Earth's population from leaving wholesale. These days, when new planets were colonized, the colonists came from older settled planets other than Earth. Earth, the source of man, could not spare its people. Its sole "industry" had at long last become the benevolent direction of human affairs, a super-government, if you will. More than four thousand man-populated worlds looked to it, in one degree or another, even those not members of United Planets.

However, no matter how strong the dream, no matter how wrapped

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up in interplanetary affairs, Ronny Bronston soon came to realize that the actual time involved in getting from one colonized planet to the next was the sheerest of boredom. All passenger activity in space is manufactured activity. There is little to do, and nothing to see once the ship goes into underspace.

One sits and reads. One plays battle chess, or other games. One talks with one's fellow passengers. One watches the Tri-Di tapes, if one is mentally of that level.

Thus it was, on the first day out, that Ronny Bronston made his way to the lounge, hoping that at least the craft was stocked with reading material new to him.

He sank into an auto-chair, as far as possible from the Tri-Di stage, and reached his hand for the stud which would activate the reading tape listing, set into the chair's arm. His eye, however, hit upon the fellow passenger seated a few feet to his right.

He frowned and said, "Don't we know each . . ." and then broke it off. Of course. It was Rita Daniels, the Interplanetary News reporter. He hadn't recognized her at first, due to the fact that she had been wearing a heavy makeup disguise, trying to look like the Supreme Matriarch, Harriet Dos Passos, when he had seen her last. Now, in her own guise, he realized that she was considerably younger than he had thought—and considerably more attractive.

She was blond, a bit too slim, pert of face, slightly freckled, and ignored current hair style in favor of a rather intricate ponytail arrangement. In spite of her pertness there was another more elusive quality, a certain vulnerableness about her mouth. She was clad very businesslike, in an inconspicuous crimson suit and she obviously was of the opinion that this somewhat colorless young man was attempting to pick her up.

She said coolly, "I am afraid not," and turned away.

What in the name of the Holy Ultimate was she doing on this vessel? The implication was obvious.

He snapped his fingers. "Citizeness Daniels. Interplanetary News."

She turned on him, her eyebrows high, in surprise. "I'm sorry. You do seem to know me. But . . . I'm afraid."

It came to him suddenly that to reveal his true identity would put her on her guard. However, he had an advantage. He knew she had been memorywashed. There was a period of at least twenty-four hours, probably more, of which she remembered nothing whatsoever, nor did her immediate superior, Rosen. It must be a confusing situation, he realized. But advantage it was.

He said easily, smiling. "You remember me. Just yesterday."

She blinked, her eyes immediately alert. Without doubt, she was keen to take advantage of an op-

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portunity to replace erased memories. "Oh, yes. But of course, Citizen . . ."

He grinned at her, both on the surface and inwardly in true amusement. "Smythe," he supplied. "Jimmy Smythe. I helped you out of that trouble with the bottle of guzzle and the traffic co-ordinator. Wow, were you drenched, eh?"

She stared at him blankly.

V

"Where are you bound?" he said, the standard traveler's gambit. He was less apt to be suspect if he asked it.

She hesitated, then smiling, "End of the line, I suppose. All the way to Phrygia."

"Some special news story?"

This time the hesitation was longer, but the question was still the expected one anybody, knowing she was a reporter, would ask. She smiled ruefully and said, "What else? And you?"

He projected embarrassment. "My job is supposed to be kind of secret. Orders are not to discuss it with anybody."

She laughed, obviously not caring, and said, "I'll have to worm it out of you. Probably make a good newstape."

He grunted self deprecation. "Hardly. Worst luck. It must be something, being with Interplanetary News. You must meet a lot of interesting people."

She looked at him, as though wondering if he were kidding. However, no matter how much of a yoke, he was probably better than no companionship at all, and it was a long trip. Besides, he knew at least something about what had happened to her during her twenty-four-hour blackout.

"Well, yes," she drew out. "I suppose so. There's a lot of fun being on the *inside* of everything." She was wondering how she could get around to asking just what the circumstances were under which he had met her. Perhaps the blunt approach would do it. He didn't seem to be particularly stute, not to say devious. At most you could say there seemed to be a kind of sad sensitivity about him, as though he felt something in life was passing him by.

"How about a drink?" he said, looking down at the wine list in the chair's arm. He winced at the prices, as he knew an ordinary traveling salesman type might do.

"In space? Good heavens."

"I'll put it on the expense account," he said with an air of gallantry. "Oiling up the press, or whatever they call it."

They settled for John Brown's Bodies and he told her the one about feeling like you were moldering in your grave, came morning.

Then he said, "How do you mean, on the inside of everything?"

She considered that. "Well, back

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when I was in school I decided that there were two kinds of people throughout the worlds. Those who were on the inside pertaining to everything that really counts, and those who were on the outside, and didn't have a clue. And I decided then and there I wanted to be an insider."

He sipped his drink and looked at her, his eyes guileless. "I'll bet you were in your sophomore year when you thought that up," he said.

"Why . . . as a matter of fact, I suppose I was," she said. "How did you know?"

"I used to work in statistics," he said meaninglessly. He covered over. "But what is an example of being on the inside?"

She touched the tip of her slightly freckled nose, in a young girl's gesture, slightly incongruous on the part of an experienced newshen. "Well, let's take one of the early examples. Have you ever heard of a man named Hearst?"

He had but he said no.

"Well, Hearst was the owner of a newspaper chain back about the turn of the Twentieth Century. At that time he supported a group that believed the United States was getting into the colony grabbing game too late. He beat the drums for intervention in Cuba, where a great deal of American capital was invested, against Spain. The story is that he sent a photographer down to take pictures of the war. The photographer cabled that there wasn't any war. And Hearst cabled back, *You supply the photos, I'll supply the war.* And he continued to beat the drums. Not long after, the American battleship *Maine* was sunk in Havana harbor."

Ronny nodded. "I've often wondered who sank the *Maine,*" he said.

She looked at him.

He said reasonably, "Obviously, it had to be one of three groups, the Cubans, the Spanish or the Americans. No one else was involved. Of them all, the Spanish had the least reason to sink it. The sad excuse for a war that followed was ample proof that they wanted to provoke no such scrap." He paused, then added thoughtfully, "I wonder if the ship was well insured."

"Look," she demanded, "who's being cynical now?"

He laughed, as though embarrassed. "Go on."

"So, pushed by Hearst and other drum beaters, President McKinley got increasingly tougher. Unfortunately, the Spanish didn't co-operate. Their queen ordered Cuban hostilities suspended, in an attempt to placate the Americans. They were doing all they could to keep the war from happening. However, Hearst and the other drum beaters hardly mentioned her efforts, and McKinley ignored the fact that the potential enemy had already offered capitulation when he ad-

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dressed Congress asking for war measures. To wind it all up, the Spanish were clobbered. It was like taking candy from babes."

Ronny attempted to portray dismay. "So that's what it's like to be on the inside. You mean the press can actually influence the news."

She laughed at him in scorn. "My dear Citizen Smythe, the press today makes the news. We shape it to fulfill our own needs, to realize our own ideals, to build a better race."

He looked at her wide-eyed, in complete sympathy. "The way you put it, it's absolutely inspiring."

She had his admiring interest now, and responded. "Take for instance," she explained, "some planet of which we don't approve. Suppose that three news items came out of there one day. The first mentions a new cure for cancer, the second some startling statistics on industrial progress being made, the third mentions a riot by high-school children who overturn some copter-cabs in the streets and throw stones through some windows. What story do you think we'd put on the interplanetary broadcasts?"

"You mean only the last one?"

"Why should we mention the other two?" she said reasonably.

"Well, doesn't it kind of involve freedom of speech, or of the press, or something?"

She scoffed at him. "It's our press, isn't it? The freedom consists of printing what we wish."

"Well, that isn't the way I should have put it. I mean, the right of the public to know . . . or something."

She scoffed again. "Let's have another of these. What did you call them? This time we'll put it on Interplanetary News' swindle sheet." She dialed the drinks. "It's up to us, we who're on the inside to decide what the public ought to know. They're a bunch of yokes, not up to making decisions."

Ronny thought about it. "Well, possibly the reason they're yokes, like you say, incapable of making competent decisions is because they're improperly informed. But anyway, that's the reason you're going to Phrygia, eh? Something really inside is going on."

She sipped the potent drink and scowled at him. "As a matter of fact, I don't know what's going on. But it's something very big. It involves Baron Wyler himself."

"Who's Baron Wyler?" Ronny said, trying to look as though he were trying to look interested.

She was stung by the fact that she didn't seem to be impressing him. "I can see you're not one of those inside. The Baron is the most aggressive single man in UP. He's Supreme Commandant of Phrygia and Phrygia is the most aggressive planet in the system."

Ronny snorted. "What good does it do to be aggressive these days? Under United Planets, no member planet is allowed to interfere with

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any other. Where can your aggressiveness go besides inward?"

She opened her mouth to retort, then closed it suddenly. She looked into her drink. "These are strong, aren't they, Jerry?"

"Pretty strong, all right. In the auto-bars they usually have a sign, only one to a customer."

She cocked her head to one side. "Oh, listen. That song." She wagged her head to it, setting her blond ponytail aswing. It was coming from the Tri-Di stage at the other end of the lounge. "Do you dance?" she said.

"Well, a little. I'm not very good at this rock'n'swing stuff."

She stood up. "Neither am I. Let's try this, it's an old favorite of mine."

He took her in his arms and they joined half a dozen other couples on the small dance floor.

They had taken only a few steps before she said tightly, "That's what I thought. You're carrying a shooter, aren't you?"

"I beg your pardon?"

She stopped dancing, turned and returned to her chair. She began to pick up her half-finished drink, but then put it down again, decisively.

He lowered himself to his own seat, across from her, and looked at her. It was her ball to bounce.

She said bitterly, "It's that ineffective air of yours. Who're you from? How did you know my name?"

"Like I said, I met you yesterday?"

"Yes. You also said your name was Jimmy Smythe and then managed to forget that, not correcting me when I called you Jerry."

She had him there. Ronny had to laugh aloud.

She said, bitterly, "You look smarter when you laugh. How did you know my name?"

Ronny shook his head, as though sorry she wouldn't believe him.

She said, "If you met me yesterday, then you probably have something to do with the Commissariat of Interplanetary Affairs."

"Why should that follow?" he said mildly.

"Because yesterday . . ." she hesitated, then plunged on, "through a tip given us by . . . one of our informants, I went to the Octagon, on an assignment from Dave Rosen. I was memory-washed there, and now can't even remember the assignment."

Ronny played it out. "Why not ask this . . . what was his name? Rosen? . . . what he sent you for?"

"He was memorywashed, too, as you undoubtedly are aware."

He shrugged. "I thought that was very illegal. Who did it?"

"How could we know? I told you, we were memorywashed."

Ronny scowled puzzlement at her. "Well, why not just check back with your informant and find out what tip you were working on?"

"That's what I'm doing," she said, still bitterly. "Unfortunately,

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he's gone all the way to Phrygia." She got up, preparatory to stomping off. "And don't ask me why we don't simply ultra-wave him. All-Planet Press, the Bureau of Investigation and who knows who else, would be listening in. Good-*by*, Jerry!"

"Jimmy," Ronny said mildly. "Sure you wouldn't like another drink?" I was really beginning to enjoy our talk, about being inside and all."

Rita Daniels wasn't as much of a lightweight as his first encounter on the spaceliner with her might have indicated. She avoided him for two days, then showed up at his table in the passenger's mess while he was finishing off some fruit in the way of dessert.

He began to come to his feet, but she slid into a chair before he could invite her.

"Your name is Ronald Bronston," she informed him. "And you're an operative for Ross Metaxa in that Section G mystery outfit. In fact," she added snappishly, "you're one of his top hatchetmen. I must say, it's hard to believe."

He said mildly, "You Interplanetary News people have your resources, haven't you?"

"What do you want with me?" she said flatly.

"Nothing," he told her. He didn't like this. If he hadn't been a flat he would have let the girl alone. Evidently, she had an in with Baron Wyler, or, at least, Interplanetary News did, and she through that organization. Now the Baron would be informed that Agent Bronston was on his way, and the Baron didn't cotton to Section G.

"Then what are you doing following me?"

"I wasn't aware that I was, Citizeness Daniels. We're simply on the same vessel." He twisted his mouth ruefully. "Why don't we start all over again?"

"And you continue to pump me? No thanks. Do you deny that you're going to Phrygia?"

He thought about it. "No. I don't deny that. But, you know, I could reverse the question. Why are you following me?"

"Don't be silly."

"Well, we're on the same spacecraft and you don't deny you're going to Phrygia."

She stood again, abruptly. "I don't know why I was memory-washed, but obviously something big is in the wind and my job is to find out what."

He nodded, mildly. "So that Interplanetary News will be inside, eh?"

She glared at him. "And don't be too sure that Section G won't be outside."

He wasn't too sure at all.

A few hours before estimated coming-out time, he approached the captain's private quarters and looked into the door's screen. He

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said, "Ronald Bronston, requesting an interview with Captain Henhoff."

The screen said, "The captain is busy. Could you state your business?"

He brought forth his badge and held it to the screen. "Important matters involving the Bureau of Investigation."

In a few moments, the door opened. Ronny stepped through.

Captain Henhoff's quarters were moderately ample, considering that this was, after all, a spacecraft. He was seated at a desk, going through reports, a junior officer across from him, taking orders.

The captain, frowning, said, "Citizen Bronston? What can I do for you? Frankly, I am afraid I've never heard of Section G of the Bureau of Investigation."

Ronny looked at the junior officer. "May I speak to you privately?"

The frown had become a testy scowl. However, the skipper said, "Howard, go on out into the corridor. I'll call you."

Howard got up, looked at Ronny, shrugged and left.

The captain said, "Well?"

Ronny laid it on the line. "We'll be coming out of underspace and setting down at Phrygia in a matter of hours. I'm on a special mission. I have reason to believe an attempt will be made at the spaceport to apprehend me. I want to be smuggled off the ship in some manner."

Captain Henhoff leaned back in his swivel chair. "That's asking a lot."

Ronny said, "I suggest you get in touch with your superiors and ask whether or not you should cooperate with Section G."

Henhoff looked at him for long moments. He said finally, "I suppose that won't be necessary." He thought about it. "They use pilots at Phrygia. Usually, three men pick us up in orbit and supervise setting us down. When we've finally set down, a spaceport auto-floater picks them up and runs them back to the spacepilot quarters, while the ship is still going through quarantine procedures. You can leave with them. I'll see that one of the men fixes you up in a uniform near enough to those the pilots wear to get you by. Think that would do it?"

"It should," Ronny nodded. "Thanks, Captain."

"You're not doing anything against the Phrygian government are you? I don't want to get into trouble with that gang."

"Of course not. I've shown you my credentials. You don't think the Department of Interplanetary Justice goes about meddling in the affairs of member planets of UP, do you?" Ronny was very righteous.

"No. Of course not."

He left the liner in the spacepilot's auto-floater, as provided, receiving no more than a few stares from those worthies. They couldn't

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have cared less. They probably figured he was some Tri-Di entertainment star, beating the fans out of an opportunity to give him the rush when the regular passengers disembarked.

His precautions had been well merited.

At the foot of the spaceliner's disembarking ladder, he noted, stood three brawny, though inconspicuously dressed men. He didn't have to look at their feet to know their calling.

The Supreme Commandant's welcoming committee for visiting Section G operatives. Citizeness Daniels was doing her best to make certain that while Interplanetary News got inside, the Bureau of Investigation didn't.

VI

The auto-floater left him off at the spacepilot's quarters and Ronny Bronston started off up the street immediately. He wanted to get out of the vicinity of the spaceport as soon as possible. He imagined that it would take a half hour or so before the Phrygians realized that he had slipped through their fingers. He didn't know what their instructions were. Whether they had meant simply not to allow him to disembark, or whether he was to be picked up and questioned by Phrygian authorities—probably the latter. Undoubtedly, they had their own version of Scop. Nobody, but nobody, stood up under questioning these days.

He had none of the local means of exchange, whatever it was. His instructions had been to go immediately to the United Planets building and get in touch with Section G operative Phil Birdman, who would check him out on the local situation.

The auto-floater he had been in with the spacepilots had been similar to those on Earth, and were fairly general on the more advanced planets. He assumed there were taxis, of some sort or another, and kept his eyes open for something resembling a stand, having no idea of how the locals summoned such a vehicle.

He was struck by a certain *sameness* about this city. It was, he knew, named Phrygia and was the capital city of the planet of the same name.

The sameness, he decided, even as he strode briskly up a shopping street, came from the fact that so many of the buildings, vehicles, signs, traffic indicators and what not, were those of Earth, Avalon, Shangri-La, Catalina and Jefferson —the most advanced worlds. Evidently, Phrygia was quick to pick up any discoveries and developments pioneered elsewhere. Well, that was commendable.

There was one thing, though. The average person in the street seemed to have a drab quality. Not one person in a hundred seemed

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up to the styles and general appearance of well being that you would find, say, on Earth or Shangri-La. Yes, a gray drabness that you couldn't quite put your finger on. They seemed well fed and healthy enough, however.

He came to what would seem to be a cab stand, and stood a moment looking at the first vehicle in line. He wanted to avoid asking questions and thus branding himself a stranger.

Well, he could only try. If the cab wasn't fitted to take instructions in Earth Basic, he was out of luck.

He opened the door and slipped into a rear seat. He made himself comfortable and said into the screen, "The United Planets Building."

No trouble. The vehicle started up and edged itself into the street traffic.

The UP Building, he found, he could have easily walked to. It was less than a mile from the spaceport.

There were two Space Marines on guard at the door. Ronny Bronston called out to one of them.

The marine marched over and scowled down into the car.

Ronny flashed his badge. "I just came from the spaceport and have no local exchange. Can you pay the cab off for me?"

"Oh. Yes, sir. Certainly. They use credit cards here, sir." The marine brought one from his pocket and held it to the cab's screen. The door automatically opened.

Ronny stepped out and said, "Now, quickly, take me to Citizen Phil Birdman."

The marine blinked. "Yes, sir." He turned and marched off, Ronny following.

The suite of offices was lettered simply, Interplanetary Trade.

Ronny said, "Thanks. I'll have that cab fare returned to you."

"Not necessary, sir," the space soldier said stiffly. "We're on unlimited expense account." He did an about-face and was off.

Ronny looked after him for a moment. How does it feel to be a professional soldier when there hasn't been a war for centuries? He grunted sourly. Perhaps the other would be practicing his trade before very long.

He opened the door and entered. It was a reception room. He walked over to the screen and said, "Ronald Bronston, Section G. To see Phil Birdman."

A door beyond opened immediately and a very dark-complexioned man, in his mid-forties, well over six feet tall and with a startling handsome face, came hurrying out, hand extended.

"Come in!" he said. "Holy Jumping Zen, it's been two years since I've seen a fellow agent from Section G."

Ronny ignored the hand. He brought his wallet out and showed

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his badge. He touched it with a finger and the badge glowed silver.

Birdman grunted, laughed, said, "O.K., O.K., if you want to play it formal." He fished his own wallet out and displayed his badge. He touched it with a finger, and like Bronston's it shone brightly.

Ronny stuck out his hand for the shake, grinning self-deprecation.

Birdman cocked his head on one side. "Something must be up."

"Yes," Ronny said. "Let's get out of here."

The tall dark man looked at him. "Get out to where? Come on in the office and we'll have some firewater."

Ronny shook his head impatiently. "I'm already on the run. They'll probably be here any minute. Surely you've got an ultimate hideout —just in case."

"Wait till I get my shooter," the other clipped. He hurried back into the inner office, returned in moments, shrugging what was obviously a shoulder holster into a more comfortable position beneath his jacket.

"This way."

He led Ronny through a series of doors and halls, finally emerging at the back of the building. There was a row of hovercars. Birdman slid into one, a speedy looking model. Ronny slipped into the seat beside him.

"We're not going very far in this, are we?" Ronny growled. "If it's yours, it's spotted."

"Of course," Birdman grunted. "Who're you working with?" His hand maneuvered the vehicle out of the parking area and into the traffic stream.

"Directly under the Old Man," Ronny said.

"Oh? And Sid Jakes? How's Sid?"

"Chuckling his fool head off," Ronny said.

They spoke no more for the next fifteen minutes, during which time Phil Birdman put on a show of how to lose a possible tail and how to leave no possible trail behind in a big city. They dropped his car after a few miles, sending it back to the UP Building. They took a cab for a time. Then they got out and walked. They took a rolling-road for a time. They took a pneumatic. Then they walked some more.

Finally, in a residential area, they entered a house. It seemed deserted. They entered a closet. The closet was an elevator.

When they left the elevator, they were in a Spartan apartment, well equipped from the Section G gimmick department, and from communications and weaponry.

Ronny looked about and whistled approvingly through his teeth. "Nice setup, considering you're only one man here."

Birdman nodded. "I'm going to have to brace Sid Jakes on that. We need a bigger staff. Phrygia is more important than they seem to think back there in the Octagon."

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He headed for a manual bar. "Now how about that firewater?"

"Firewater?" Ronny said.

Phil Birdman grinned at him. "Ugh, guzzle you palefaces call it. I'm from Piegan."

Ronny frowned in memory. "Oh, yes," he said. "Colonized by Amerinds. Mostly Blackfeet and Sioux. Diehards who still wanted to get away from the whiteman and go back to the old tribal society. Set up kind of a primitive communism, based on clan society."

"That's the way it started," Birdman nodded. "How about pseudo-whiskey?" At Ronny's nod, he added, "And water?" He finished the drinks and returned with them.

Ronny was already seated. He took the drink and said, "How did it work out?"

"Piegan? Terribly. You can't go back, no matter how strong the dream."

"So what happened?"

Birdman grinned at him, wryly. "Section G happened. A few of the boys turned up and subverted our institutions. Best thing that ever happened. We've still got an Indian society, but we're rapidly industrializing. Couple of more decades and we'll be as advanced as Phrygia."

Ronny took half of the pseudo-whiskey down. "If any of us are around a couple of decades from now."

The big Indian looked at him. "I knew it was something important," he said.

Ronny nodded and briefed the other operative on recent developments.

Their drinks were finished by the time he was through. His host got up to get new ones. "And now?" he said.

Ronny shrugged. "My assignment isn't particularly important. Just one phase of the whole. Ross Metaxa wants me to take what steps I can to keep Baron Wyler from sounding off about the Octagon's plans to speed up the amalgamation of United Planets and all other human settled worlds. From what this mopsy Rita Daniels tells me, the Baron has been playing footsie with Interplanetary News."

"Footsie, yet," Birdman snorted. "Baron Wyler *is* Interplanetary News."

Ronny gaped at him. "What're you talking about?"

"I told you we need a larger staff here. There's a lot cooking that's going to have to come right before Metaxa's eyes. I'm working on the report right now. At any rate, Baron Wyler owns communications on Phrygia. All communications. And he also controls Interplanetary News. Who did you think owned it?"

"It never occurred to me to wonder. I realize, of course, that we've got every kind of socioeconomic system ever dreamed up through the centuries at one place or another in United Planets, but I didn't think in terms of an organization as

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strong as Interplanetary News being privately owned. Certainly not by one individual."

"It's not exactly one individual," the Indian growled. "More like a family, and the Baron's the head of the family."

He made a face. "I'd better give you some background. You were right when you said UP has every socioeconomic system ever dreamed up by man, on one planet or the other. It also has a ot of criss-crosses."

Ronny frowned at him.

Birdman explained. "Take communism. We've got planets, such as my own Piegan used to be, that practice primitive tribal communism. Then we've got planets of 'purists' who have attempted to build a society such as Marx and Engels originally had in mind back in 1848. Then we've got a sample or two of communism as Lenin saw it, then one or two as DeLeon adapted socialism to America, and at least one on the Stalinist conception—that's a *real* honey—and one I can think of based on Trotsky's heresy. And Mao, the Chinese. And Tito, remember Tito?"

"No," Ronny said, "but you've made your point. There's a lot of confusion on just what communism is."

The Indian was nodding. "Yes. Well, the crisscross on this planet is a doozy. You might call it industrial feudalism. Kind of a classical capitalism gone to seed. Kind of free enterprise without either freedom or, except for a handful, any enterprise. You see, they got to the point where the wealth of Phrygia is in the hands of less than one percent of the population. The means of production, distribution, communications, the farms, the mines, the whole shebang. All owned and controlled by a comparatively few families."

Ronny grunted. "In any society, a good man gets to the top."

"Or loses his scalp trying," Birdman agreed. "If he can't, he tries to change the society. Well, they have one fairly workable way of getting around that on Phrygia. Any real stute that comes along, gets adopted into one of the big families. The Romans used to do the same thing; Octavius was an adopted son of Caesar.

"But to get on with it. There's evidently no end to the desire for wealth and the power it brings. A millionaire wants to become a billionaire and a billionaire wonders how it'd be to have a trillion. Far, far beyond the point where his own needs are completely satisfied, the stute with a power complex continues to accumulate more wealth, more power. It might not make sense to you and me, but there it is. Well, Baron Wyler has about outgrown Phrygia. He's looking for new worlds to conquer, and I've a sneaking suspicion he doesn't expect to allow United Planets to stand in his way. In fact, it

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didn't even start with the present Baron. The dream has evidently been in his family, and probably other industrial feudalistic families here, for several generations. Interplanetary News is just one of the projects designed to pave the way."

The Indian chuckled sourly. "Sounds unbelievable, eh? Well, in spite of the far-out nature of this super-loose confederation of ours, United Planets is still basically a republic. Whatever the home government of each planet, in the UP it has one voice, one vote, no more. But there's no particular reason why man, in his eruption into space, has to remain a republican. Given a strong enough ambition on the part of a few fellas like our good Baron, and what's to prevent an empire from being established?"

Ronny was shaking his head. "Too many would fight."

The other nodded in agreement. "That's what's baffled me. Something is going on. Something the Baron is counting upon to give him such an edge over the other strong worlds which would ordinarily resist his ambitions, that he'd prevail."

Ronny Bronston thought about it for a long moment, staring down into his glass. He said finally, "I suppose it's about time I got in touch with this Baron Wyler. Have you got a Section G communicator handy?"

"Over there."

Ronny sat at the indicated desk. The device was about the size of a woman's vanity case, and was propped up now so that the small screen was immediately before the operative. He activated it.

"Ronald Bronston," he said. "I want to report to Supervisor Jakes."

He sat there, saying nothing, until Sid Jakes' grinning face appeared on the screen.

"Hi, Ronny," he chuckled. "On Phrygia, eh? How's that redskin coming along?"

Ronny said, "That redskin is evidently a one-man task force. He's dug up the fact that Baron Wyler controls Interplanetary News and is evidently prettying up a scheme to unite UP . . ."

"Isn't that what we want to do?"

". . . Under his leadership. Possibly I should say, under his dictatorship."

The supervisor scoffed. "Neat trick, if he could pull it off."

"Evidently, he has some reason to believe he can."

Sid Jakes looked at him thoughtfully. "Get a complete report on this through soonest, Ronny."

"Phil Birdman just about has it finished. Meanwhile, would it be possible for you to put through an order making me a plenipotentiary extraordinary from UP to the Supreme Commandant of Phrygia?"

"Have you gone drivel-happy?"

"No. The Baron's got his heavies out looking for me. I want to face him, but not on the kind of basis he evidently has in mind. I want some weight to throw around."

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Jakes thought about it some more. "All right. Within twenty-four hours, you'll be a special mission from the President of UP to Baron Wyler. You'll have to play it from there. Dream up your own idea of what the mission is. Wyler won't dare touch you, with such a commission." He grinned. "This oughta be a neat trick."

He faded from the screen.

Ronny turned back to his companion.

Birdman said, "I'm not sure I like this. Wyler's feeling his oats. He's getting near the point where he's ready to take action. I don't think he's afraid of the Commissariat of Interplanetary Affairs."

Ronny shrugged. "The way you brought me here, to this hideout, I couldn't find it again. So even though he slips me Scop, I can't betray you. For myself, I'm no big loss. If I don't get away from him, again, there's not much he can get out of me that he doesn't already know. Now, let's get about the job of outfitting me properly to be a plenipotentiary from the President to the Baron. Sid is going to radio through to Wyler that I am to appear."

VII

If Ronny Bronston had thought the surface buildings of the nadir-scraper which housed the Interplanetary News in Greater Washington were on the ostentatious side, he could only admit he had had little upon which to base his opinion—comparatively.

Baron Wyler's official residence was some ten kilometers outside the Phrygia city limits. At first, the Section G agent couldn't place the theme, although it began to come to him when his limousine, driven by a United Planets Space Forces marine in dress uniform with another seated beside him, was stopped at a gate through a low wall by a squad of men in an armor of yesteryear and in short linen tunics. They were armed with spears, swords buckled to their sides.

The driver said from the side of his mouth, "You're getting the full official greeting, sir. Ordinarily, we could've driven inside."

Six of the guards stood at rigid attention, spear butts grounded. Another, an officer, his breastplate obviously gold, approached the hovercar, came to the salute.

He said, "Hail the Plenipotentiary from the United Planets!"

Maintaining his dignity, Ronny nodded.

The officer said, "If Your Excellency will alight, you will be conducted to audience with the Supreme Commandant."

Evidently, his two marines were going to be left here at the gate. Ronny mentally shrugged. He was already in the Baron's hands. Let them bounce the ball. He left the car.

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In a clatter and a small cloud of dust, a chariot, pulled by three enormous white horses, came speeding forth. Ronny blinked at it. He had seen chariots in illustration, and in historic Tri-Di shows, but never in actuality.

The driver pulled the horses to a rearing halt, only a few feet from him.

The officer said, not a flicker of expression on his face, "If His Excellency will mount . . ."

Ronny Bronston looked at his marines from the sides of his eyes. They remained expressionless as well. He wondered vaguely if they would have pulled this gimmick had he been an eighty-year-old man. Well, there was nothing for it. He jumped up into the wheeled vehicle and grasped the edge, next to the driver.

They were off in a clatter.

The setting was beginning to come to him. The doubleheaded ax motif, the bulls in fresco and statuary. Once as a boy, his father had taken him to the so-called Palace of Minos, at Knossus on Crete. Baron Wyler had obviously drawn upon the reconstructions of Sir Arthur Evans in building his residence. The British archeologist had notoriously excerised his imagination in the reconstruction, but many a Cretan must have turned in his grave at this version of a palace of the four-thousand-year-old civilization.

They clattered up a broad ramp, Ronny Bronston hanging on for dear life, and came to a rearing halt before an *entrada* flanked with highly colorful columns which started narrow at the bottom and widened at the roof.

There was another guard, clad in the costume of Knossus, at the entry—a full twenty of them here. They came to the salute.

An officer stepped forward, came to attention.

"The Supreme Commandant sends greetings to His Excellency the Plenipotentiary from United Planets."

Ronny stepped down from the chariot, looked at the driver bitterly. Inaudibly, he muttered, "Do you have a license to operate that thing?"

"Thanks," he said to the officer. "I would like to see the Baron immediately."

"His instructions are to bring you to his quarters upon arrival, Your Excellency."

He turned and marched, stiff-legged, into the building. Ronny followed.

As at the Interplanetary News building in Greater Washington, the resemblance to the ancient past fell off immediately in the interior. The officer's costume seemed doubly ludicrous among the hosts of guards, messengers, secretaries and officials all garbed in modern dress.

Two guards, fish cold of eye, stood before an elevator door, one

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behind a device of switches and screens. Ronny assumed he was being given an electronic frisk. Well, they'd find him clean. It would have been ridiculous to think he could approach the ruler of Phrygia armed.

The elevator opened and the officer accompanying him gestured. Ronny entered alone, the door closed and the car dropped.

The door opened and even before Ronny Bronston could step out, the tall, heavy-set man there, his face beaming, reached for his hand.

"Ronald Bronston!" he said heartily. "Your Excellency, I've been waiting for you!"

He was at least as tall as Phil Birdman, but would have outweighed the Indian by fifty pounds. He carried his weight well, gracefully might be the word. He moved as a trained pugilist moves, or perhaps one of the larger cats. His charm reached out and embraced you, all but suffocatingly. His face was open, friendly, his eyes blue and wide-set, his nose the arched Hapsburg nose, giving an aristocratic quality that only his overwhelming friendliness could dissipate.

It could only be, Ronny realized, Baron Wyler, Supreme Commandant of the Planet Phrygia, and, were Phil Birdman correct, would-be dictator of this sector of the galaxy.

He let his hand be pumped, admittedly taken aback. He realized now that although he had never seen even a photo of the Baron, that he had built up a fictitious picture of the other. Yes, the picture, he admitted in sour realization, had nothing to do with reality. Among other things, far from being a middle-aged or even elderly Prussian type, the Baron was little older than Ronny himself.

Ronny Bronston hated to be touched by another man, other than perhaps a quick handshake, however he suffered now his host to place an arm around his shoulders and lead him to as comfortable a room as the Section G agent could remember ever having been in. It was a man's room. A small but complete bar to one side. A number of large, well used chairs and couches. Racks of books that even at a distance looked interesting and oft handled. Good, well chosen, not necessarily expensive, paintings on the walls—a fireplace.

A fireplace, Ronny thought. At this distance down into the planet's crust? He wondered vaguely what effort must have gone into devising a manner of dispelling smoke and fumes.

The Baron was at the bar. "May I suggest this departure on the wines of the Rhine and Moselle? One of my ancestors imported the Riesling grape to Phrygia. Local soil conditions were somewhat different, but I trust you will find a lightness and bouquet not at all unpleasing." Even as he spoke, he was pouring from a very long

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necked bottle into two delicate crystal glasses.

Ronny found himself seated in one of the chairs, glass in hand. The Baron was across from him and now picked up a small sheaf of papers from a coffee table.

He read aloud. "Ronald Meredith Bronston, thirty-two. Born in Luana, Hawaii. Parents, Micheal L. Bronston, and Pauline Meredith. Studied, um-m-m, um-m, finished education at University of Stockholm um-m-m, um-m-m, at age of twenty-six took position at New Copenhagen in the Population Statistics Department. Was discovered by Bureau of Investigation scouts and jockeyed into Section G . . ."

Ronny stared at him. *"Jockeyed,"* he protested. "I applied for a position that would take me overspace and was lucky . . ."

Baron Wyler chuckled at him magnanimously. "My dear Bronston, no luck is involved in getting into our friend Metaxa's Section G. Not one human being in a million qualifies. Were you a bit more privy to the inner workings of your ultra-ultra cloak and dagger organization, you would know that at any given time at least a hundred of Metaxa's picked men are scouting out potential agents. You were probably selected as far back as when you were in high school."

Wyler's eyes went back to the report. "But to go on with it. Given first assignment with Supervisor Lee Chang Chu and as a result was made full agent. Um-m, um-m, worked with distinction on the planets Kropotkin, Avalon and Palermo. Has become one of Supervisor Jakes' most trusted field men. Height, weight, um-m-m, fingerprints, eye pattern, skull measurements." The Baron looked up. "Some of these statistics come directly from Section G files."

"All right," Ronny said in resignation. "You've made your point. You have a rather complete dossier on me."

The Baron put down the report and turned on his charm with a smile. "So we can dispense with preliminaries and get to the point."

Ronny said, "The point being that the Supreme Commandant of the Planet Phrygia is ambitious to encroach upon the sovereignty of fellow worlds belonging to the United Planets."

"Which is one way of putting it," the Baron nodded agreeably. "Tell me, Bronston, what is the eventual goal of this United Planets to which you have devoted your life?"

"The advancement of the human race!"

"Neatly summed up in but six words. But my dear Bronston, man has made his advances down through the ages in a wide variety of methods. Your knowledge of history must be such that you recognize the contributions of strong men who have arisen in time of need. The democratic principle does not always apply."

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Ronny said sharply, "My studies have led me to believe that man makes his greatest advances under conditions of freedom."

"An example?"

The Section G agent groped for a good one. "The Athens of the Golden Age. The Athenian democracy nourished a culture such had never been seen before, nor since."

Baron Wyler chuckled. "My dear Bronston, have you never heard of the strong man, Pericles? Besides, calling the Athenian society a democracy is somewhat stretching a point, is it not? For every Athenian citizen free to pursue the arts and sciences, there were a dozen slaves, or more, kept in complete subjugation. Come now, do you contend that if these slaves, who did the drudgery necessary to maintain the leisure of the Athenian citizens, had been given their freedom, been given complete equality, that the Golden Age could have been?"

Ronny looked at him. The Baron was obviously no fool.

The other got up, brought the bottle from the bar and refreshed glasses. The Section G agent was no connoisseur of wine, but admittedly this was the most pleasant beverage he could remember drinking. He wondered if it was available on Earth.

The Baron said, "Let me use a somewhat more recent example of strong man versus the mob."

"I wasn't exactly advocating mob rule."

"Indeed? However, remember when the Egyptian Nasser seized power in his country . . . oh, somewhere about the middle of the Twentieth Century . . . his nation had been a backward one, dominated by the big powers, ignored in the world's councils. When he took over the Suez Canal, all prophesied that waterway would soon be silted up and impassable. Instead, within a few years traffic had doubled. Borrowing, begging, securing funds and techniques from every source he could find, he began to industrialize, to irrigate, to find new potentials in his desert country. His soldiers were sent out to fill up the wells in thousands of native communities, supposedly a crime beyond understanding in a desert land. They filled them up and forced the fellahin to dig new wells in places where the water would not be contaminated with sewage. He sent soldiers out and rounded up the children and forced them into schools. Children that otherwise would have been taught nothing further than a few suras from the Koran. These were but a few things done by strongman Nasser."

Ronny was scowling at him.

The Baron twisted his mouth in deprecation. "At the same time and on the same continent, the newly emerged nation, the Congo, seemed unable to find an equivalent of Nasser, instead, in an at-

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mosphere of pseudo-democracy, they went from one barbarism to the next, going backward, rather than progressing. Come now, Citizen Bronston, don't you think conditions sometimes call for a strong man?"

Ronny put his glass down. Thus far, he had been satisfied to hold his peace, if only to see just how the other was going to bounce the ball.

Now he said, "Interpreting history isn't my field. I do know this, as Metaxa said, the human race is in the clutch. This is not the time for would-be strongmen to try to seize control of worlds other than their own. We can't afford the time, nor the energies involved in interplanetary war, and please don't attempt to put over the idea that you, or anyone else, could form an empire from the largely individualistic United Planets, without war. Baron Wyler, you saw that charred body of the intelligent alien life form. You heard what Ros . . ."

The Baron held up a hand to restrain him. He nodded, still agreeable."Indeed I did. And I was surprised that the estimable Commissioner was in possession of it. However, we could have shown him better examples."

"Better examples!"

The Baron reached out and touched a switch on the coffee table. One wall of the room clouded then became a giant screen.

The Baron fiddled with a small dial set into the table.

On the screen there faded in an extensive laboratory. At least a dozen white smocked men were working about what would appear to be an operating table. The Baron zoomed in on the scene.

Ronny sucked in his breath. Those on the screen were dissecting two bodies of what were obviously specimens of the tiny life form Metaxa had deep frozen.

Another turn of the dial. A new room, more extensive than the last. At least several thousand men, obviously technicians and mechanics, were working away at various benches, on various pieces of equipment.

The Baron said wryly, "They're trying to figure out the use of some of the devices, weapons or whatever, that we've gleaned from the alien planets." He snorted his deprecation. "Suppose you took a squad of Neanderthal men and set them down in a Twenty-fifth Century laboratory in the midst of all the products that century produced, what do you think they might accomplish?"

Ronny, his eyes bugging still, said, "Is there that much difference?"

"At least," the Baron told him. "However, as our good Metaxa pointed out at the conference, this culture is not the one we must confront. This culture was destroyed by one beyond."

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Ronny nodded. "That is the basic point, Baron Wyler. That is why the human race doesn't have the time to bother with ambitious men of the caliber of the Supreme Commandant of Phrygia. We know nothing about the culture beyond."

"Oh, I wouldn't say that," the Baron said easily. "More wine?"

He had Ronny staring again. "What do you mean by that?"

The Baron waggled a finger at him. "You see, my dear Bronston, we are far, far beyond Section G and its well intentioned plans to preserve the race. Some time ago, long before the Space Forces exploration force located the alien planets, Phrygian cruisers had found them. Properly masked, of course, we were able to descend and explore. My laboratories have been working on the equipment, and even the bodies of the aliens, as you have seen. We found a few under conditions which had preserved them."

"But you said something about the power beyond."

The other nodded. "Yes. Our little aliens left enough in the way of photographs to indicate part of what we're up against."

"Photographs?"

"Both still photographs and also a tape that one of my more brilliant young men has been able to project. It would seem that our little aliens actually landed upon at least one of the beyond culture's planets."

For the last half hour the Baron had been throwing curves faster than Ronny Bronston found himself capable of catching. Now he blurted, "What in the world is the other culture like?"

"Fantastically advanced. Among other items, it would seem they have matter conversion units that can make anything out of anything else. It would seem they have fusion reactors, and hence unlimited power. Oh yes, an unbelievably advanced technology."

"What do they look like?"

The Baron paused. "Just a moment." He played with his screen dials again, said something into an order box. The screen clouded, went clear once more.

On it was an incredibly handsome man. He was dressed in nothing more than brief shorts and sandals. He had a golden-brown coloration, was of bodily perfection seldom seen and then only among physical culture perfectionists who spend a lifetime achieving it. There was no indication that he was aware of being photographed.

"Who's that?" Ronny said blankly.

"That's one of your aliens."

"Alien! That's a *man*."

"Um-m-m," the Baron said. "There's just one thing in which he differs from man as we know him."

He paused for effect. "These aliens don't seem to be intelligent."

To be concluded

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WARRIOR

The Dorsai were a very special breed of men. It took a direct contact with one, though, to make it understandable that they were *not* Men of War, but something different. And deadlier.

GORDON R. DICKSON

Kelly Freas

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The spaceliner coming in from New Earth and Freiland, worlds under the Sirian sun, was delayed in its landing by traffic at the spaceport in Long Island Sound. The two police lieutenants, waiting on the bare concrete beyond the shelter of the Terminal buildings, turned up the collars of their cloaks against the hissing sleet, in this unweatherproofed area. The sleet was turning into tiny hailstones that bit and stung all exposed areas of skin. The gray November sky poured them down without pause or mercy, the vast, reaching surface of concrete seemed to dance with their white multitudes.

"Here it comes now," said Tyburn, the Manhattan Complex police lieutenant, risking a glance up into the hailstorm. "Let me do the talking when we take him in."

"Fine by me," answered Breagan, the spaceport officer, "I'm only here to introduce you—and because it's my bailiwick. You can have Kenebuck, with his hood connections, and his millions. If it were up to me, I'd let the soldier get him."

"It's him," said Tyburn, "who's likely to get the soldier—and that's why I'm here. You ought to know that."

The great mass of the interstellar ship settled like a cautious mountain to the concrete two hundred yards off. It protruded a landing stair near its base like a metal leg, and the passengers began to disembark. The two policemen spotted their man immediately in the crowd.

"He's big," said Breagan, with the judicious appraisal of someone safely on the sidelines, as the two of them moved forward.

"They're all big, these professional military men off the Dorsai world," answered Tyburn, a little irritably, shrugging his shoulders against the cold, under his cloak. "They breed themselves that way."

"I know they're big," said Breagan. "This one's bigger."

The first wave of passengers was rolling toward them now, their quarry among the mass. Tyburn and Breagan moved forward to meet him. When they got close they could see, even through the hissing sleet, every line of his dark, unchanging face looming above the lesser heights of the people around him, his military erectness molding the civilian clothes he wore until they might as well have been a uniform. Tyburn found himself staring fixedly at the tall figure as it came toward him. He had met such professional soldiers from the Dorsai before, and the stamp of their breeding had always been plain on them. But this man was somehow more-so, even than the others Tyburn had seen. In some way he seemed to be the spirit of the Dorsai, incarnate.

He was one of twin brothers, Tyburn remembered now from the dossier back at his office. Ian and Kensie were their names, of the Graeme family at Foralie, on the Dorsai. And the report was that

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Kensie had two men's likability, while his brother Ian, now approaching Tyburn, had a double portion of grim shadow and solitary darkness.

Staring at the man coming toward him, Tyburn could believe the dossier now. For a moment, even, with the sleet and the cold taking possession of him, he found himself believing in the old saying that, if the born soldiers of the Dorsai ever cared to pull back to their own small, rocky world, and challenge the rest of humanity, not all the thirteen other inhabited planets could stand against them. Once, Tyburn had laughed at that idea. Now, watching Ian approach, he could not laugh. A man like this would live for different reasons from those of ordinary men—and die for different reasons.

Tyburn shook off the wild notion. The figure coming toward him, he reminded himself sharply, was a professional military man—nothing more.

Ian was almost to them now. The two policemen moved in through the crowd and intercepted him.

"Commandant Ian Graeme?" said Breagan. "I'm Kaj Breagan of the spaceport police. This is Lieutenant Walter Tyburn of the Manhatten Complex Force. I wonder if you could give us a few minutes of your time?"

Ian Graeme nodded, almost indifferently. He turned and paced along with them, his longer stride making more leisurely work of their brisk walking, as they led him away from the route of the disembarking passengers and in through a blank metal door at one end of the Terminal, marked *Unauthorized Entry Prohibited.* Inside, they took an elevator tube up to the offices on the Terminal's top floor, and ended up in chairs around a desk in one of the offices.

All the way in, Ian had said nothing. He sat in his chair now with the same indifferent patience, gazing at Tyburn, behind the desk, and at Breagan, seated back against the wall at the desk's right side. Tyburn found himself staring back in fascination. Not at the granite face, but at the massive, powerful hands of the man, hanging idly between the chair-arms that supported his forearms. Tyburn, with an effort, wrenched his gaze from those hands.

"Well, Commandant," he said, forcing himself at last to look up into the dark, unchanging features, "you're here on Earth for a visit, we understand."

"To see the next-of-kin of an officer of mine." Ian's voice, when he spoke at last, was almost mild compared to the rest of his appearance. It was a deep, calm voice, but lightless—like a voice that had long forgotten the need to be angry or threatening. Only . . . there was something sad about it, Tyburn thought.

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"A James Kenebuck?" said Tyburn.

"That's right," answered the deep voice of Ian. "His younger brother, Brian Kenebuck, was on my staff in the recent campaign on Freiland. He died three months back."

"Do you," said Tyburn, "always visit your deceased officers' next of kin?"

"When possible. Usually, of course, they die in line of duty."

"I see," said Tyburn. The office chair in which he sat seemed hard and uncomfortable underneath him. He shifted slightly. "You don't happen to be armed, do you, Commandant?"

Ian did not even smile.

"No," he said.

"Of course, of course," said Tyburn, uncomfortable. "Not that it makes any difference." He was looking again, in spite of himself, at the two massive, relaxed hands opposite him. "Your . . . extremities by themselves are lethal weapons. We register professional karate and boxing experts here, you know—or did you know?"

Ian nodded.

"Yes," said Tyburn. He wet his lips, and then was furious with himself for doing so. Damn my orders, he thought suddenly and whitely, I don't have to sit here making a fool of myself in front of this man, no matter how many connections and millions Kenebuck owns.

"All right, look here, Commandant," he said, harshly, leaning forward. "We've had a communication from the Freiland-North Police about you. They suggest that you hold Kenebuck—James Kenebuck—responsible for his brother Brian's death."

Ian sat looking back at him without answering.

"Well," demanded Tyburn, raggedly after a long moment, "do you?"

"Force-leader Brian Kenebuck," said Ian calmly, "led his Force, consisting of thirty-six men at the time, against orders farther than was wise into enemy perimeter. His Force was surrounded and badly shot up. Only he and four men returned to the lines. He was brought to trial in the field under the Mercenaries Code for deliberate mishandling of his troops under combat conditions. The four men who had returned with him testified against him. He was found guilty and I ordered him shot."

Ian stopped speaking. His voice had been perfectly even, but there was so much finality about the way he spoke that after he finished there was a pause in the room while Tyburn and Breagan stared at him as if they had both been tranced. Then the silence, echoing in Tyburn's ears, jolted him back to life.

"I don't see what all this has to do with James Kenebuck, then," said Tyburn. "Brian committed some . . . military crime, and

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was executed for it. You say you gave the order. If anyone's responsible for Brian Kenebuck's death then, it seems to me it'd be you. Why connect it with someone who wasn't even there at the time, someone who was here on Earth all the while, James Kenebuck?"

"Brian," said Ian, "was his brother."

The emotionless statement was calm and coldly reasonable in the silent, brightly-lit office. Tyburn found his open hands had shrunk themselves into fists on the desk top. He took a deep breath and began to speak in a flat, official tone.

"Commandant," he said, "I don't pretend to understand you. You're a man of the Dorsai, a product of one of the splinter cultures out among the stars. I'm just an old-fashioned Earthborn—but I'm a policeman in the Manhattan Complex and James Kenebuck is . . . well, he's a taxpayer in the Manhattan Complex."

He found he was talking without meeting Ian's eyes. He forced himself to look at them—they were dark unmoving eyes.

"It's my duty to inform you," Tyburn went on, "that we've had intimations to the effect that you're to bring some retribution to James Kenebuck, because of Brian Kenebuck's death. These are only intimations, and as long as you don't break any laws here on Earth, you're free to go where you want and see whom you like. But this *is Earth, Commandant.*"

He paused, hoping that Ian would make some sound, some movement. But Ian only sat there, waiting.

"We don't have any Mercenaries Code here, Commandant," Tyburn went on harshly. "We haven't any feud-right, no *droit-de-main*. But we do have laws. Those laws say that, though a man may be the worst murderer alive, until he's brought to book in our courts, under our process of laws, no one is allowed to harm a hair of his head. Now, I'm not here to argue whether this is the best way or not; just to tell you that that's the way things are." Tyburn stared fixedly into the dark eyes. "Now," he said, bluntly, "I know that if you're determined to try to kill Kenebuck without counting the cost, I can't prevent it."

He paused and waited again. But Ian still said nothing.

"I know," said Tyburn, "that you can walk up to him like any other citizen, and once you're within reach you can try to kill him with your bare hands before anyone can stop you. *I* can't stop you in that case. But what I can do is catch you afterwards, if you succeed, and see you convicted and executed for murder. And you *will* be caught and convicted, there's no doubt about it. You can't kill James Kenebuck the way someone like you would kill a man,

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and get away with it here on Earth —do you understand that, Commandant?"

"Yes," said Ian.

"All right," said Tyburn, letting out a deep breath. "Then you understand. You're a sane man and a Dorsai professional. From what I've been able to learn about the Dorsai, it's one of your military tenets that part of a man's duty to himself is not to throw his life away in a hopeless cause. And this cause of yours to bring Kenebuck to justice for his brother's death, is hopeless."

He stopped. Ian straightened in a movement preliminary to getting up.

"Wait a second," said Tyburn.

He had come to the hard part of the interview. He had prepared his speech for this moment and rehearsed it over and over again —but now he found himself without faith that it would convince Ian.

"One more word," said Tyburn. "You're a man of camps and battlefields, a man of the military; and you must be used to thinking of yourself as a pretty effective individual. But here, on Earth, those special skills of yours are mostly illegal. And without them you're ineffective and helpless. Kenebuck, on the other hand, is just the opposite. He's got money—millions. And he's got connections, some of them nasty. And he was born and raised here in Manhattan Complex." Tyburn stared emphatically at the tall, dark man, willing him to understand. "Do you follow me? If you, for example, should suddenly turn up dead here, we just might not be able to bring Kenebuck to book for it. Where we absolutely could, and would, bring you to book if the situation were reversed. Think about it."

He sat, still staring at Ian. But Ian's face showed no change, or sign that the message had gotten through to him.

"Thank you," Ian said. "If there's nothing more, I'll be going."

"There's nothing more," said Tyburn, defeated. He watched Ian leave. It was only when Ian was gone, and he turned back to Breagen that he recovered a little of his self-respect. For Breagan's face had paled.

Ian went down through the Terminal and took a cab into Manhattan Complex, to the John Adams Hotel. He registered for a room on the fourteenth floor of the transient section of that hotel and inquired about the location of James Kenebuck's suite in the resident section; then sent his card up to Kenebuck with a request to come by to see the millionaire. After that, he went on up to his own room, unpacked his luggage, which had already been delivered from the spaceport, and took out a small, sealed package. Just at that

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moment there was a soft chiming sound and his card was returned to him from a delivery slot in the room wall. It fell into the salver below the slot and he picked it up, to read what was written on the face of it. The penciled note read:

Come on up—

K.

He tucked the card and the package into a pocket and left his transient room. And Tyburn, who had followed him to the hotel, and who had been observing all of Ian's actions from the second of his arrival, through sensors placed in the walls and ceilings, half rose from his chair in the room of the empty suite directly above Kenebuck's, which had been quietly taken over as a police observation post. Then, helplessly, Tyburn swore and sat down again, to follow Ian's movements in the screen fed by the sensors. So far there was nothing the policeman could do legally—nothing but watch.

So he watched as Ian strode down the softly carpeted hallway to the elevator tube, rose in it to the eightieth floor and stepped out to face the heavy, transparent door sealing off the resident section of the hotel. He held up Kenebuck's card with its message to a concierge screen beside the door, and with a soft sigh of air the door slid back to let him through. He passed on in, found a second elevator tube, and took it up thirteen more stories. Black doors opened before him—and he stepped one step forward into a small foyer to find himself surrounded by three men.

They were big men—one, a lantern-jawed giant, was even bigger than Ian—and they were vicious. Tyburn, watching through the sensor in the foyer ceiling that had been secretly placed there by the police the day before, recognized all of them from his files. They were underworld muscle hired by Kenebuck at word of Ian's coming; all armed, and brutal and hair-trigger—mad dogs of the lower city. After that first step into their midst, Ian stood still. And there followed a strange, unnatural cessation of movement in the room.

The three stood checked. They had been about to put their hands on Ian to search him for something, Tyburn saw, and probably to rough him up in the process. But something had stopped them, some abrupt change in the air around them. Tyburn, watching, felt the change as they did; but for a moment he felt it without understanding. Then understanding came to him.

The difference was in Ian, in the way he stood there. He was, saw Tyburn, simply . . . waiting. That same patient indifference Tyburn had seen upon him in the Terminal office was there again. In the split second of his single step into the room he had discovered

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the men, had measured them, and stopped. Now, he waited, in his turn, for one of them to make a move.

A sort of black lightning had entered the small foyer. It was abruptly obvious to the watching Tyburn, as to the three below, that the first of them to lay hands on Ian would be the first to find the hands of the Dorsai soldier upon him—and those hands were death.

For the first time in his life, Tyburn saw the personal power of the Dorsai fighting man, made plain without words. Ian needed no badge upon him, standing as he stood now, to warn that he was dangerous. The men about him were mad dogs; but, patently, Ian was a wolf. There was a difference with the three, which Tyburn now recognized for the first time. Dogs —even mad dogs—fight, and the losing dog, if he can, runs away. But no wolf runs. For a wolf wins every fight but one, and in that one he dies.

After a moment, when it was clear that none of the three would move, Ian stepped forward. He passed through them without even brushing against one of them, to the inner door opposite, and opened it and went on through.

He stepped into a three-level living room stretching to a large, wide window, its glass rolled up, and black with the sleet-filled night. The living room was as large as a small suite in itself, and filled with people, men and women, richly dressed. They held cocktail glasses in their hands as they stood or sat, and talked. The atmosphere was heavy with the scents of alcohol, and women's perfumes and cigarette smoke. It seemed that they paid no attention to his entrance, but their eyes followed him covertly once he had passed.

He walked forward through the crowd, picking his way to a figure before the dark window, the figure of a man almost as tall as himself, erect, athletic-looking with a handsome, sharp-cut face under whitish-blond hair that stared at Ian with a sort of incredulity as Ian approached.

"Graeme . . . ?" said this man, as Ian stopped before him. His voice in this moment of off-guardedness betrayed its two levels, the semi-hoodlum whine and harshness underneath, the polite accents above. "My boys . . . you didn't—" he stumbled, "leave anything with them when you were coming in?"

"No," said Ian. "You're James Kenebuck, of course. You look like your brother." Kenebuck stared at him.

"Just a minute," he said. He set down his glass, turned and went quickly through the crowd and into the foyer, shutting the door behind him. In the hush of the room, those there heard, first silence then a short, unintelligible burst of sharp voices, then silence again. Kene-

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buck came back into the room, two spots of angry color high on his cheekbones. He came back to face Ian.

"Yes," he said, halting before Ian. "They were supposed to . . . tell me when you came in." He fell silent, evidently waiting for Ian to speak, but Ian merely stood, examining him, until the spots of color on Kenebuck's cheekbones flared again.

"Well?" he said, abruptly. "Well? You came here to see me about Brian, didn't you? What about Brian?" He added, before Ian could answer, in a tone suddenly brutal. "I know he was shot, so you don't have to break that news to me. I suppose you want to tell me he showed all sorts of noble guts—refused a blindfold and that sort of—"

"No," said Ian. "He didn't die nobly."

Kenebuck's tall, muscled body jerked a little at the words, almost as if the bullets of an invisible firing squad had poured into it.

"Well . . . that's fine!" he laughed angrily. "You come light-years to see me and then you tell me that! I thought you liked him —liked Brian."

"Liked him? No," Ian shook his head. Kenebuck stiffened, his face for a moment caught in a gape of bewilderment. "As a matter of fact," went on Ian, "he was a glory-hunter. That made him a poor soldier and a worse officer. I'd have transferred him out of my command if I'd had time before the campaign on Frieland started. Because of him, we lost the lives of thirty-two men in his Force, that night."

"Oh." Kenebuck pulled himself together, and looked sourly at Ian. "Those thirty-two men. You've got them on your conscience is that it?"

"No," said Ian. There was no emphasis on the word as he said it, but somehow to Tyburn's ears above, the brief short negative dismissed Kenebuck's question with an abruptness like contempt. The spots of color on Kenebuck's cheeks flamed.

"You didn't like Brian and your conscience doesn't bother you—what're you here for, then?" he snapped.

"My duty brings me," said Ian.

"Duty?" Kenebuck's face stilled, and went rigid.

Ian reached slowly into his pocket as if he were surrendering a weapon under the guns of an enemy and did not want his move misinterpreted. He brought out the package from his pocket.

"I brought you Brian's personal effects," he said. He turned and laid the package on a table beside Kenebuck. Kenebuck stared down at the package and the color over his cheekbones faded until his face was nearly as pale as his hair. Then slowly, hesitantly, as if he

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were approaching a booby-trap, he reached out and gingerly picked it up. He held it and turned to Ian, staring into Ian's eyes, almost demandingly.

"It's in here?" said Kenebuck, in a voice barely above a whisper, and with a strange emphasis.

"Brian's effects," said Ian, watching him.

"Yes . . . sure. All right," said Kenebuck. He was plainly trying to pull himself together, but his voice was still almost whispering. "I guess . . . that settles it."

"That settles it," said Ian. Their eyes held together, "Good-by," said Ian. He turned and walked back through the silent crowd and out of the living room. The three muscle-men were no longer in the foyer. He took the elevator tube down and returned to his own hotel room.

Tyburn, who with a key to the service elevators, had not had to change tubes on the way down as Ian had, was waiting for him when Ian entered. Ian did not seem surprised to see Tyburn there, and only glanced casually at the policeman as he crossed to a decanter of Dorsai whisky that had since been delivered up to the room.

"That's that, then!" burst out Tyburn, in relief. "You got in to see him and he ended up letting you out. You can pack up and go, now. It's over."

"No," said Ian. "Nothing's over yet." He poured a few inches of the pungent, dark whisky into a glass, and moved the decanter over another glass. "Drink?"

"I'm on duty," said Tyburn, sharply.

"There'll be a little wait," said Ian, calmly. He poured some whisky into the other glass, took up both glasses, and stepped across the room to hand one to Tyburn. Tyburn found himself holding it. Ian had stepped on to stand before the wall-high window. Outside, night had fallen; but—faintly seen in the lights from the city levels below—the sleet here above the weather shield still beat like small, dark ghosts against the transparency.

"Hang it, man, what more do you want?" burst out Tyburn. "Can't you see it's you I'm trying to protect—as well as Kenebuck? I don't want *anyone* killed! If you stay around here now, you're asking for it. I keep telling you, here in Manhattan Complex you're the helpless one, not Kenebuck. Do you think he hasn't made plans to take care of you?"

"Not until he's sure," said Ian, turning from the ghost-sleet, beating like lost souls against the windowglass, trying to get in.

"Sure about what? Look, Commandant," said Tyburn, trying to speak calmly, "half an hour after we hear from the Freiland-North Police about you, Kenebuck called my office to ask for police protec-

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tion." He broke off, angrily. "Don't look at me like that! How do I know how he found out you were coming? I tell you he's rich, and he's got connections! But the point is, the police protection he's got is just a screen—an excuse—for whatever he's got planned for you on his own. You saw those hoods in the foyer!"

"Yes," said Ian, unemotionally.

"Well, think about it!" Tyburn glared at him. "Look, I don't hold any brief for James Kenebuck! All right—let me tell you about him! We knew he'd been trying to get rid of his brother since Brian was ten—but blast it, Commandant, Brian was no angel, either—"

"I know," said Ian, seating himself in a chair opposite Tyburn.

"All right, you know! I'll tell you anyway!" said Tyburn. "Their grandfather was a local kingpin—he was in every racket on the eastern seaboard. He was one of the mob, with millions he didn't dare count because of where they'd come from. In their father's time, those millions started to be fed into legitimate businesses. The third generation, James and Brian, didn't inherit anything that wasn't legitimate. Hell, we couldn't even make a jaywalking ticket stick against one of them, if we'd ever wanted to. James was twenty and Brian ten when their father died, and when he died the last bit of tattle-tale gray went out of the family linen. But they kept their hoodlum connections, Commandant!"

Ian sat, glass in hand, watching Tyburn almost curiously.

"Don't you get it?" snapped Tyburn. "I tell you that, on paper, in law, Kenebuck's twenty-four carat gilt-edge. But his family was hoodlum, he was raised like a hoodlum, and he thinks like a hood! He didn't want his young brother Brian around to share the crown prince position with him—so he set out to get rid of him. He couldn't just have him killed, so he set out to cut him down, show him up, break his spirit, until Brian took one chance too many trying to match up to his older brother, and killed himself off."

Ian slowly nodded.

"All right!" said Tyburn. "So Kenebuck finally succeeded. He chased Brian until the kid ran off and became a professional soldier—something Kenebuck wouldn't leave his wine, women and song long enough to shine at. And he can shine at most things he really wants to shine at, Commandant. Under that hood attitude and all those millions, he's got a good mind and a good body that he's made a hobby out of training. But, all right. So now it turns out Brian was still no good, and he took some soldiers along when he finally got around to doing what Kenebuck wanted, and getting himself killed. All right! But what can you do about it? What can anyone do

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about it, with all the connections, and all the money and all the law on Kenebuck's side of it? And, why should you think about doing something about it, anyway?"

"It's my duty," said Ian. He had swallowed half the whisky in his glass, absently, and now he turned the glass thoughtfully around, watching the brown liquor swirl under the forces of momentum and gravity. He looked up at Tyburn. "You know that, Lieutenant."

"Duty! Is duty that important?" demanded Tyburn. Ian gazed at him, then looked away, at the ghost-sleet beating vainly against the glass of the window that held it back in the outer dark.

"Nothing's more important than duty," said Ian, half to himself, his voice thoughtful and remote. "Mercenary troops have the right to care and protection from their own officers. When they don't get it, they're entitled to justice, so that the same thing is discouraged from happening again. That justice is a duty."

Tyburn blinked, and unexpectedly a wall seemed to go down in his mind.

"Justice for those thirty-two dead soldiers of Brian's!" he said, suddenly understanding. "That's what brought you here!"

"Yes." Ian nodded, and lifted his glass almost as if to the sleet-ghosts to drink the rest of his whisky.

"But," said Tyburn, staring at him, "You're trying to bring a civilian to justice. And Kenebuck has you out-gunned and out-maneuvered—"

The chiming of the communicator screen in one corner of the hotel room interrupted him. Ian put down his empty glass, went over to the screen and depressed a stud. His wide shoulders and back hid the screen from Tyburn, but Tyburn heard his voice.

"Yes?"

The voice of James Kenebuck sounded in the hotel room.

"Graeme—listen!"

There was a pause.

"I'm listening," said Ian, calmly.

"I'm alone now," said the voice of Kenebuck. It was tight and harsh. "My guests have gone home. I was just looking through that package of Brian's things . . ." He stopped speaking and the sentence seemed to Tyburn to dangle unfinished in the air of the hotel room. Ian let it dangle for a long moment.

"Yes?" he said, finally.

"Maybe I was a little hasty . . ." said Kenebuck. But the tone of his voice did not match the words. The tone was savage. "Why don't you come up, now that I'm alone, and we'll . . . talk about Brian, after all?"

"I'll be up," said Ian.

He snapped off the screen and turned around.

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"Wait!" said Tyburn, starting up out of his chair. "You can't go up there!"

"Can't?" Ian looked at him. "I've been invited, Lieutenant."

The words were like a damp towel slapping Tyburn in the face, waking him up.

"That's right . . ." he stared at Ian. "Why? Why'd he invite you back?"

"He's had time," said Ian, "to be alone. And to look at that package of Brian's."

"But . . ." Tyburn scowled. "There was nothing important in that package. A watch, a wallet, a passport, some other papers . . . Customs gave us a list. There wasn't anything unusual there."

"Yes," said Ian. "And that's why he wants to see me again."

"But what does he want?"

"He wants me," said Ian. He met the puzzlement of Tyburn's gaze. "He was always jealous of Brian," Ian explained, almost gently. "He was afraid Brian would grow up to outdo him in things. That's why he tried to break Brian, even to kill him. But now Brian's come back to face him."

"Brian . . . ?"

"In me," said Ian. He turned toward the hotel door.

Tyburn watched him turn, then suddenly—like a man coming out of a daze, he took three hurried strides after him as Ian opened the door.

"Wait!" snapped Tyburn. "He won't be alone up there! He'll have hoods covering you through the walls. He'll definitely have traps set for you . . ."

Easily, Ian lifted the policeman's grip from his arm.

"I know," he said. And went.

Tyburn was left in the open doorway, staring after him. As Ian stepped into the elevator tube, the policeman moved. He ran for the service elevator that would take him back to the police observation post above the sensors in the ceiling of Kenebuck's living room.

When Ian stepped into the foyer the second time, it was empty. He went to the door to the living room of Kenebuck's suite, found it ajar. and stepped through it. Within the room was empty, with glasses and overflowing ashtrays still on the tables; the lights had been lowered. Kenebuck rose from a chair with its back to the far, large window at the end of the room. Ian walked toward him and stopped when they were little more than an arm's length apart.

Kenebuck stood for a second, staring at him, the skin of his face tight. Then he made a short almost angry gesture with his right hand. The gesture gave away the fact that he had been drinking.

"Sit down!" he said. Ian took a comfortable chair and Kenebuck sat down in the one from which he had just risen. "Drink?" said Kenebuck. There was a decanter and

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glasses on the table beside and between them. Ian shook his head. Kenebuck poured part of a glass for himself.

"That package of Brian's things," he said, abruptly, the whites of his eyes glinting as he glanced up under his lids at Ian, "there was just personal stuff. Nothing else in it!"

"What else did you expect would be in it?" asked Ian, calmly.

Kenebuck's hands clenched suddenly on the glass. He stared at Ian, and then burst out into a laugh that rang a little wildly against the emptiness of the large room.

"No, no . . ." said Kenebuck, loudly. "I'm asking the questions, Graeme. I'll ask them! What made you come all the way here, to see me, anyway?"

"My duty," said Ian.

"Duty? Duty to whom—Brian?" Kenebuck looked as if he would laugh again, then thought better of it. There was the white, wild flash of his eyes again. "What was something like Brian to you? You said you didn't even like him."

"That was beside the point," said Ian, quietly. "He was one of my officers."

"One of your officers! He was my brother! That's more than being one of your officers!"

"Not," answered Ian in the same voice, "where justice is concerned."

"Justice?" Kenebuck laughed. "Justice for Brian? Is that it?"

"And for thirty-two enlisted men."

"Oh—" Kenebuck snorted laughingly. "Thirty-two men . . . those thirty-two men!" He shook his head. "I never knew your thirty-two men, Graeme, so you can't blame me for them. That was Brian's fault; him and his idea—what was the charge they tried him on? Oh, yes, that he and his thirty-two or thirty-six men could raid enemy Headquarters and come back with the enemy Commandant. Come back . . . covered with glory." Kenebuck laughed again. "But it didn't work. Not my fault."

"Brian did it," said Ian, "to show you. You were what made him to it."

"Me? Could I help it if he never could match up to me?" Kenebuck stared down at his glass and took a quick swallow from it then went back to cuddling it in his hands. He smiled a little to himself. "Never could even *catch* up to me." He looked whitely across at Ian. "I'm just a better man, Graeme. You better remember that."

Ian said nothing. Kenebuck continued to stare at him; and slowly Kenebuck's face grew more savage.

"Don't believe me, do you?" said Kenebuck, softly. "You better believe me. I'm not Brian, and I'm not bothered by Dorsais. You're here, and I'm facing you—alone."

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"Alone?" said Ian. For the first time Tyburn, above the ceiling over the heads of the two men, listening and watching through hidden sensors, thought he heard a hint of emotion—contempt—in Ian's voice. Or had he imagined it?

"Alone—Well!" James Kenebuck laughed again, but a little cautiously. "I'm a civilized man, not a hick frontiersman. But I don't have to be a fool. Yes, I've got men covering you from behind the walls of the room here. I'd be stupid not to. And I've got this . . ." He whistled, and something about the size of a small dog, but made of smooth, black metal, slipped out from behind a sofa nearby and slid on an aircushion over the carpeting to their feet.

Ian looked down. It was a sort of satchel with an orifice in the top from which two metallic tentacles protruded slightly.

Ian nodded slightly.

"A medical mech," he said.

"Yes," said Kenebuck, "cued to respond to the heartbeats of anyone in the room with it. So you see, it wouldn't do you any good, even if you somehow knew where all my guards were and beat them to the draw. Even if you killed me, this could get to me in time to keep it from being permanent. So, I'm unkillable. Give up!" He laughed and kicked at the mech. "Get back," he said to it. It slid back behind the sofa.

"So you see . . ." he said. "Just sensible precautions. There's no trick to it. You're a military man—and what's that mean? Superior strength. Superior tactics. That's all. So I outpower your strength, outnumber you, make your tactics useless—and what are you? Nothing." He put his glass carefully aside on the table with the decanter. "But I'm not Brian. I'm not afraid of you. I could do without these things if I wanted to."

Ian sat watching him. On the floor above, Tyburn had stiffened.

"Could you?" asked Ian.

Kenebuck stared at him. The white face of the millionaire contorted. Blood surged up into it, darkening it. His eyes flashed whitely.

"What're you trying to do—test me?" he shouted suddenly. He jumped to his feet and stood over Ian, waving his arms furiously. It was, recognized Tyburn overhead, the calculated, self-induced hysterical rage of the hoodlum world. But how would Ian Graeme below know that? Suddenly, Kenebuck was screaming. "You want to try me out? You think I won't face you? You think I'll back down like that brother of mine, that . . ." he broke into a flood of obscenity in which the name of Brian was freely mixed. Abruptly, he whirled about to the walls of the room, yelling at them. "Get out of there! All right, out! Do you hear me? All of you! Out—"

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Panels slid back, bookcases swung aside and four men stepped into the room. Three were those who had been in the foyer earlier when Ian had entered for the first time. The other was of the same type.

"Out!" screamed Kenebuck at them. "Everybody out. Outside, and lock the door behind you. I'll show this Dorsai, this . . ." almost foaming at the mouth, he lapsed into obscenity again.

Overhead, above the ceiling, Tyburn found himself gripping the edge of the table below the observation screen so hard his fingers ached.

"It's a trick!" he muttered between his teeth to the unhearing Ian. "He planned it this way! Can't you see that?"

"Graeme armed?" inquired the police sensor technician at Tyburn's right. Tyburn jerked his head around momentarily to stare at the technician.

"No," said Tyburn. "Why?"

"Kenebuck is." The technician reached over and tapped the screen, just below the left shoulder of Kenebuck's jacket image. "Slug-thrower."

Tyburn made a fist of his aching right fingers and softly pounded the table before the screen in frustration.

"All right!" Kenebuck was shouting below, turning back to the still-seated form of Ian, and spreading his arms wide. "Now's your chance. Jump me! The door's locked. You think there's anyone else near to help me? Look!" He turned and took five steps to the wide, knee-high to ceiling window behind him, punched the control button and watched as it swung wide. A few of the whirling sleet-ghosts outside drove from out of ninety stories of vacancy, into the opening—and fell dead in little drops of moisture on the window-sill as the automatic weather shield behind the glass blocked them out.

He stalked back to Ian, who had neither moved nor changed expression through all this. Slowly, Kenebuck sank back down into his chair, his back to the night, the blocked-out cold and the sleet.

"What's the matter?" he asked, slowly, acidly. "You don't do anything? Maybe *you* don't have the nerve, Graeme?"

"We were talking about Brian," said Ian.

"Yes, Brian . . ." Kenebuck said, quite slowly. "He had a big head. He wanted to be like me, but no matter how he tried—how I tried to help him—he couldn't make it." He stared at Ian. "That's just the way, he never could make it—the way he decided to go into enemy lines when there wasn't a chance in the world. That's the way he was—a loser."

"With help," said Ian.

"What? What's that you're saying?" Kenebuck jerked upright in his chair.

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"You helped him lose," Ian's voice was matter of fact. "From the time he was a young boy, you built him up to want to be like you —to take long chances and win. Only your chances were always safe bets, and his were as unsafe as you could make them."

Kenebuck drew in an audible, hissing breath.

"You've got a big mouth, Graeme!" he said, in a low, slow voice.

"You wanted," said Ian, almost conversationally, "to have him kill himself off. But he never quite did. And each time he came back for more, because he had it stuck into his mind, carved into his mind, that he wanted to impress you—even though by the time he was grown, he saw what you were up to. He knew, but he still wanted to make you admit that he wasn't a loser. You'd twisted him that way while he was growing up, and that was the way he grew."

"Go on," hissed Kenebuck. "Go on, big mouth."

"So, he went off-Earth and became a professional soldier," went on Ian, steadily and calmly. "Not because he was drafted like someone from Newton or a born professional from the Dorsai, or hungry like one of the ex-miners from Coby. But to show you you were wrong about him. He found one place where you couldn't compete with him, and he must have started writing back to you to tell you about it—half rubbing it in, half-asking for the pat on the back you never gave him."

Kenebuck sat in the chair and breathed. His eyes were all one glitter.

"But you didn't answer his letters," said Ian. "I suppose you thought that'd make him desperate enough to finally do something fatal. But he didn't. Instead he succeeded. He went up through the ranks. Finally, he got his commission and made Force-Leader, and you began to be worried. It wouldn't be long, if he kept on going up, before he'd be above the field officer grades, and out of most of the actual fighting."

Kenebuck sat perfectly still, a little leaning forward. He looked almost as if he were praying, or putting all the force of his mind to willing that Ian finish what he had started to say.

"And so," said Ian, "on his twenty-third birthday—which was the day before the night on which he led his men against orders into the enemy area—you saw that he got this birthday card . . ." He reached into a side pocket of his civilian jacket and took out a white, folded card that showed signs of having been savagely crumpled but was now smoothed out again. Ian opened it and laid it beside the decanter on the table between their chairs, the sketch and legend facing Kenebuck. Kenebuck's eyes dropped to look at it.

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The sketch was a crude outline of a rabbit, with a combat rifle and battle helmet discarded at its feet, engaged in painting a broad yellow stripe down the center of its own back. Underneath this picture was printed in block letters, the question—"WHY FIGHT IT?"

Kenebuck's face slowly rose from the sketch to face Ian, and the millionaire's mouth stretched at the corners, and went on stretching into a ghastly version of a smile.

"Was that all . . . ?" whispered Kenebuck.

"Not all," said Ian. "Along with it, glued to the paper by the rabbit, there was this—"

He reached almost casually into his pocket.

"No, you don't!" screamed Kenebuck triumphantly. Suddenly he was on his feet, jumping behind his chair, backing away toward the darkness of the window behind him. He reached into his jacket and his hand came out holding the slugthrower, which cracked loudly in the room. Ian had not moved, and his body jerked to the heavy impact of the slug.

Suddenly, Ian had come to life. Incredibly, after being hammered by a slug, the shock of which should have immobilized an ordinary man, Ian was out of the chair on his feet and moving forward. Kenebuck screamed again—this time with pure terror—and began to back away, firing as he went.

"Die, you—! Die!" he screamed. But the towering Dorsai figure came on. Twice it was hit and spun clear around by the heavy slugs, but like a football fullback shaking off the assaults of tacklers, it plunged on, with great strides narrowing the distance between it and the retreating Kenebuck.

Screaming finally, Kenebuck came up with the back of his knees against the low sill of the open window. For a second his face distorted itself out of all human shape in a grimace of its terror. He looked, to right and to left, but there was no place left to run. He had been pulling the trigger of his slugthrower all this time, but now the firing pin clicked at last upon an empty chamber. Gibbering, he threw the weapon at Ian, and it flew wide of the driving figure of the Dorsai, now almost upon him, great hands outstretched.

Kenebuck jerked his head away from what was rushing toward him. Then, with a howl like a beaten dog, he turned and flung himself through the window before those hands could touch him, into ninety-odd stories of unsupported space. And his howl carried away down into silence.

Ian halted. For a second he stood before the window, his right hand still clenched about whatever it was he had pulled from his pocket. Then, like a toppling tree, he fell.

—As Tyburn and the technician with him finished burning through

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the ceiling above and came dropping through the charred opening into the room. They almost landed on the small object that had come rolling from Ian's now-lax hand. An object that was really two objects glued together. A small paintbrush and a transparent tube of glaringly yellow paint.

"I hope you realize, though," said Tyburn, two weeks later on an icy, bright December day as he and the recovered Ian stood just inside the Terminal waiting for the boarding signal from the spaceliner about to take off for the Sirian worlds, "what a chance you took with Kenebuck. It was just luck it worked out for you the way it did."

"No," said Ian. He was as apparently emotionless as ever; a little more gaunt from his stay in the Manhattan hospital, but he had mended with the swiftness of his Dorsai constitution. "There was no luck. It all happened the way I planned it."

Tyburn gazed in astonishment.

"Why . . ." he said, "if Kenebuck hadn't had to send his hoods out of the room to make it seem necessary for him to shoot you himself when you put your hand into your pocket that second time —or if you hadn't had the card in the first place—" He broke off, suddenly thoughtful. "You mean . . . ?" he stared at Ian. "Having the card, you planned to have Kenebuck get you alone . . . ?"

"It was a form of personal combat," said Ian. "And personal combat is my business. You assumed that Kenebuck was strongly entrenched, facing my attack. But it was the other way around."

"But you had to come to him—"

"I had to appear to come to him," said Ian, almost coldly. "otherwise he wouldn't have believed that he had to kill me—before I killed him. By his decision to kill me, he put himself in the attacking position."

"But he had all the advantages!" said Tyburn, his head whirling. "You had to fight on his ground, here where he was strong . . ."

"No," said Ian. "You're confusing the attack position with the defensive one. By coming here, I put Kenebuck in the position of finding out whether I actually had the birthday card, and the knowledge of why Brian had gone against orders into enemy territory that night. Kenebuck planned to have his men in the foyer shake me down for the card—but they lost their nerve."

"I remember," murmured Tyburn.

"Then, when I handed him the package, he was sure the card was in it. But it wasn't," went on Ian. "He saw his only choice was to give me a situation where I might feel it was safe to admit having the card and the knowledge. He had to know about that, because Brian had called his bluff by going out

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and risking his neck after getting the card. The fact Brian was tried and executed later made no difference to Kenebuck. That was a matter of law—something apart from hoodlum guts, or lack of guts. If no one knew that Brian was braver than his older brother, that was all right; but if I knew, he could only save face under his own standards by killing me."

"He almost did," said Tyburn. "Any one of those slugs—"

"There was the medical mech," said Ian, calmly. "A man like Kenebuck would be bound to have something like that around to play safe—just as he would be bound to set an amateur's trap." The boarding horn of the spaceliner sounded. Ian picked up his luggage bag. "Good-by," he said, offering his hand to Tyburn.

"Good-by . . ." he muttered. "So you were just going along with Kenebuck's trap, all of it. I can't believe it . . ." He released Ian's hand and watched as the big man swung around and took the first two strides away toward the bulk of the ship shining in the winter sunlight. Then, suddenly, the numbness broke clear from Tyburn's mind. He ran after Ian and caught at his arm. Ian stopped and swung half-around, frowning slightly.

"I can't believe it!" cried Tyburn. "You mean you went up there, *knowing* Kenebuck was going to pump you full of slugs and maybe kill you—all just to square things for thirty-two enlisted soldiers under the command of a man you didn't even like? I don't believe it—you can't be that cold-blooded! I don't care how much of a man of the military you are!"

Ian looked down at him. And it seemed to Tyburn that the Dorsai face had gone away from him, somehow become as remote and stony as a face carved high up on some icy mountain's top.

"But I'm not just a man of the military," Ian said. "That was the mistake Kenebuck made, too. That was why he thought that stripped of military elements, I'd be easy to kill."

Tyburn, looking at him, felt a chill run down his spine as icy as wind off a glacier.

"Then, in heaven's name," cried Tyburn. "What are you?"

Ian looked from his far distance down into Tyburn's eyes and the sadness rang as clear in his voice finally, as iron-shod heels on barren rock.

"I am a man of war," said Ian, softly.

With that, he turned and went on; and Tyburn saw him black against the winter-bright sky, looming over all the other departing passengers, on his way to board the spaceship. ■

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HEAVY ELEMENTS

BY EDWARD C. WALTERSCHEID

There are materials too brittle to form by bending—yet they can be drawn to complex shapes by explosive forming. Others can best be shaped by electroplating that adds atoms one at a time. With others, welding pieces together works best.

Strangely, the same sort of phenomena apply to building the superheavy transuranian elements. Some have to be explosively formed—some made in a reactor, a neutron at a time, and others by welding on large chunks.

The making of an element is not an easy thing. The medieval alchemists tried and found that they had set themselves an impossible task. Physicists today find that it is not impossible, only very difficult.

Prior to 1940, ninety-two natural elements were thought to exist, although element 43, technetium, and element 61, promethium, had not been found in nature. In that year, however, the first positive identification of a new element with atomic number 93 was made. Element 93, which came to be called neptunium, was the first element heavier

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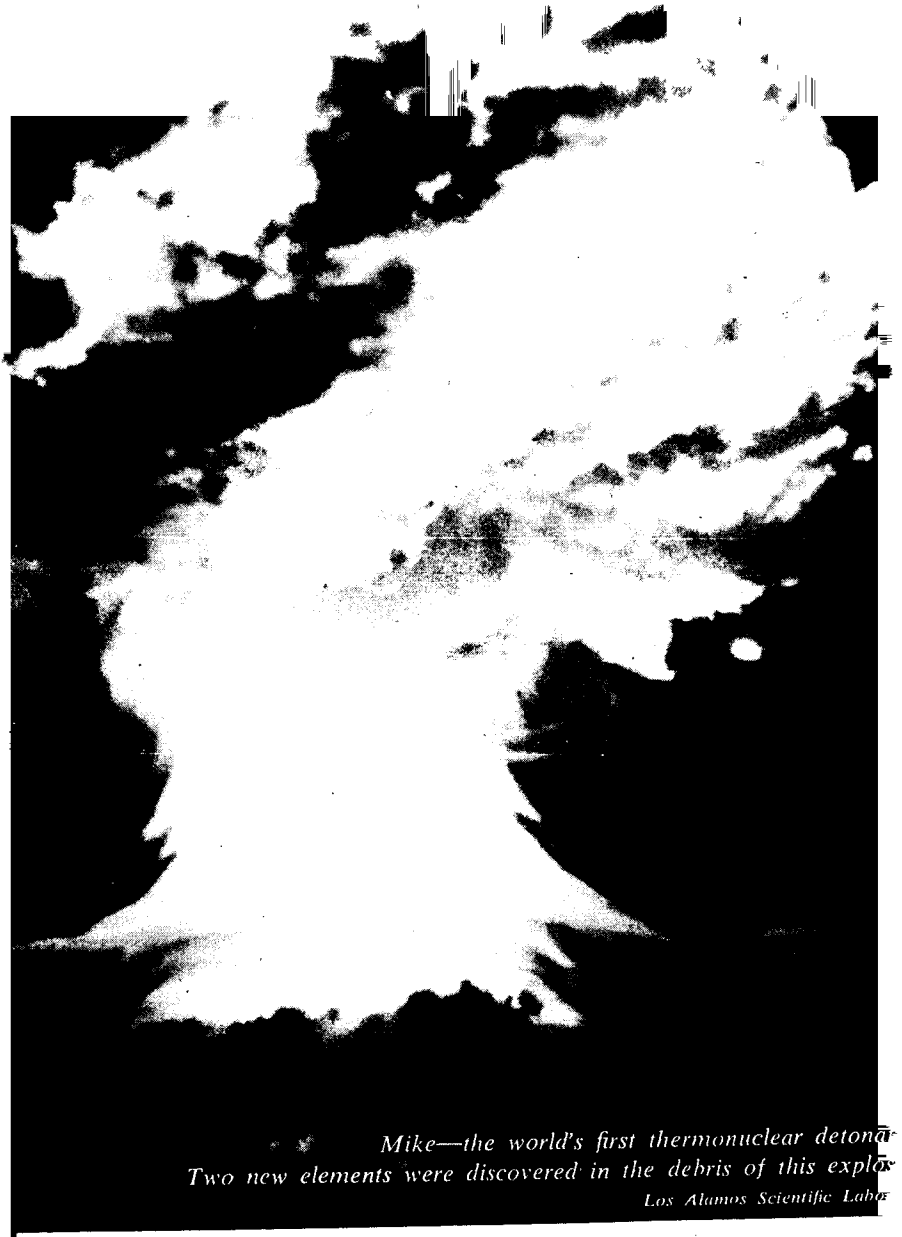

Mike—the world's first thermonuclear detonat
Two new elements were discovered in the debris of this explo
Los Alamos Scientific Labo

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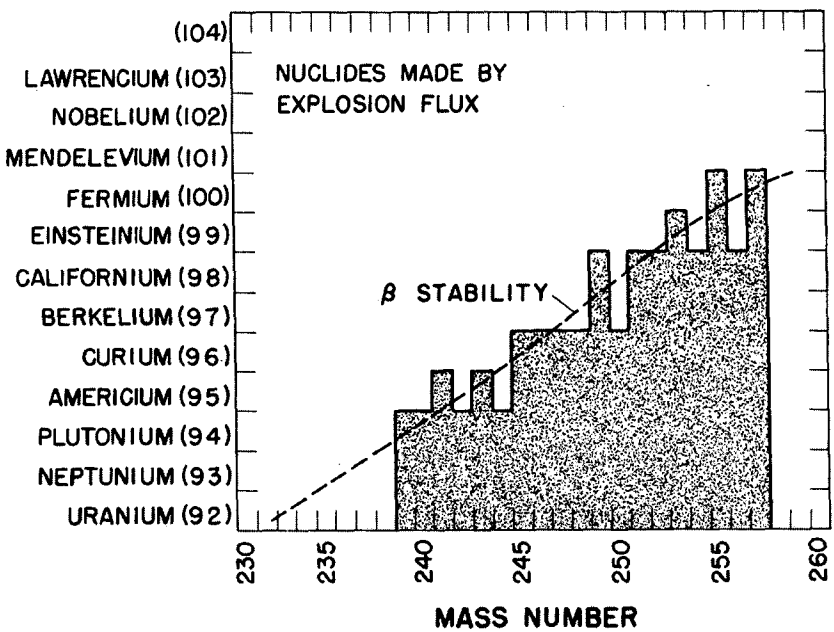
than uranium to be synthesized by man. Shortly thereafter element 94, plutonium, was discovered and transmutation had become reality.

As nuclear scientists soon discovered, the making of an element becomes increasingly difficult as the atomic number increases. Nonetheless, through the ingenious use of high-energy particle accelerators the number of synthetic or "heavy" elements has steadily increased so that the periodic table of the elements now shows that all elements through atomic number 103 have been positively identified. Elements 99 and 100 were discovered in radioactive debris from the world's first thermonuclear explosion in 1952.

Thus far element 104 has resisted all attempts at synthesis and identification in this country. In August 1964, however, the Russians announced that they had successfully produced 104 by bombarding a plutonium target with very energetic neon ions in a cyclotron. United States scientists have not yet been able to duplicate the Russian experiments, so there is yet—at the time of this writing—no verification of the Russian claims.

Is there a limit to the number of elements that can be synthesized? Yes there is, although theoretically



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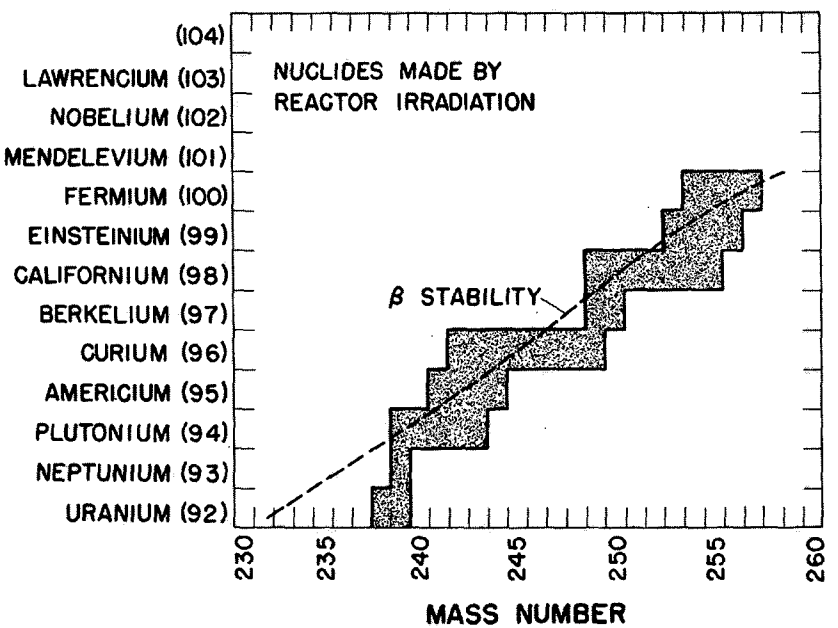
we are still a long way from it. As a matter of practicability, however, we are fast approaching a limit which should occur at element 110 or thereabout. The purpose of this article is to discuss the practicalities—more commonly known as problems—involved in producing, identifying, and studying the heavy elements—particularly elements 100 and above.

Before understanding how elements are made, it is first necessary to know what it is that causes one element to be different from another. The atoms of elements are composed of positively charged protons, negatively charged electrons, and—with the exception of the most common form of hydrogen—neutral particles called neutrons. It is the number of protons in the nucleus that differentiates one element from another. This number is known as the atomic number. Element 100 (fermium), for example, has one hundred protons in its nucleus and hence an atomic number of 100.

At first glance, the atomic number would seem to be all important insofar as the heavy elements are concerned. There is another number, however, called the mass number, which is fully as important. The reason for this is that an atomic



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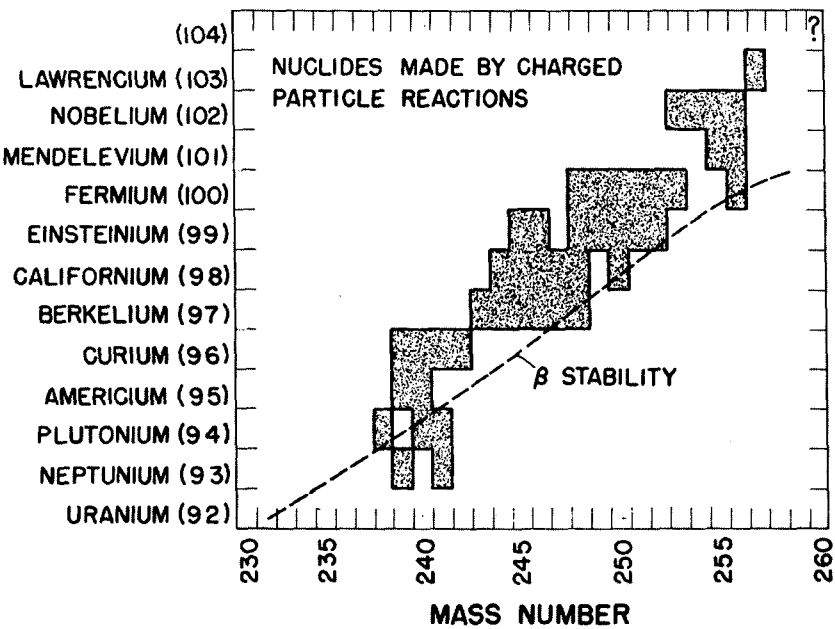
nucleus is a combination of nucleons (protons and neutrons). The weight of an atom is essentially dependent on the number of nucleons it contains. The mass number of a nucleus then is simply the total number of protons and neutrons in that nucleus. The mass numbers of the twelve heavy elements that have thus far been produced range from 231 to 260.

As we shall see, mass number is a significant parameter in determining the relative stability of heavy element isotopes. (Isotopes of an element have the same number of protons in the nucleus but differing numbers of neutrons.)

The problem in producing heavy synthetic elements is that they are all radioactive; that is, they undergo a process of natural transmutation into other elements. The time required for one half of a quantity of a radioactive element to decay into another element is known as the half-life of that element. The heavier a synthetic element is, the shorter its half-life tends to be. The half-life varies according to the particular isotope of an element, but it is almost uniformly short when the atomic number of the element exceeds 100.

Thus the isotope of element 102 that has been positively identified



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has a half-life of about three seconds! The half-life of the identified isotope of lawrencium, element 103, has been found to be eight seconds. The Russians state that the isotope of element 104 they have synthesized has a half-life of 0.3 second. For all we know, an isotope of 104 may have already been formed in this country, but with a half-life so short that there has been no opportunity to identify it.

Why these elements are so unstable requires an explanation of some nuclear facts of life. The nucleus has unique "binding" forces tending to hold it together. These forces are neither electrostatic nor gravitational but are extremely powerful over short ranges. However, electrostatic (coulomb) forces that tend to disrupt the nucleus are also present. It's the old story of like charges repelling each other. Thus the protons in a nucleus have a tendency to pull it apart. Stability within the nucleus depends on binding forces being stronger than disruptive forces. In the heavy elements there is not much difference between the two.

Stability, however, is a relative thing. Even if there are strong disruptive forces present, a nucleus will not undergo a spontaneous transformation unless a more stable nuclear arrangement is possible and can be achieved without costing more energy than the nucleus possesses.

There are three ways in which an unstable heavy nucleus transforms itself into a more stable configuration: beta emission, alpha emission, and spontaneous fission. Which one of these will actually occur depends on the nature of the instability. It should be noted that all these forms of radioactive decay are independent of each other. A particular nuclear species can decay by any one or all three modes.

Beta decay is a nuclear process whereby an excess or deficiency of neutrons within a nucleus is corrected. Nuclei which have too many neutrons emit a beta particle (electron) and thus increase their atomic number by one. Nuclei which are neutron deficient either absorb an orbital electron or emit a positron —a positively charged particle with the same mass as an electron. In each case a proton in the nucleus is converted to a neutron and the atomic number is decreased by one. Positron emission is a relatively unimportant decay mechanism for the heavy elements.

Alpha decay is the emission of an alpha particle (helium nucleus) from an unstable nucleus. Theoretically, this type of decay can occur whenever the mass of the heavy, unstable nucleus is greater than the sum of the masses of the helium nucleus and the decay product. The heavier the element, the more probable it is that alpha decay will occur.

Spontaneous fission is similar to

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the more familiar induced fission except that no external influence is necessary to cause the fission reaction to occur. The end result is the same—lots of energy and two or more fission products of roughly comparable size—but the disintegration of the nucleus occurs spontaneously rather than as the result of neutron capture.

But which form of radioactive decay is likely to happen in a particular unstable element? The answer to this question first of all requires a closer look at the binding forces within the nucleus. These binding forces are dependent on the relative numbers of protons and neutrons present.

Stable nuclei of low mass number (20 or less) have a neutron-to-proton ratio close to one. However, when the number of protons or neutrons in the nucleus exceeds twenty, this ratio must exceed one. If it does not, the nucleus will be unstable.

The reason for this is that as the atomic number (number of protons) increases, the electrostatic disruptive force grows rapidly. This force is roughly proportional to Z^2/R, where Z is the atomic number and R is the radius of the nucleus. Now R varies as $A^{1/3}$, where A is the mass number, so that the disruptive force can be given by $Z^2A^{1/3}$. It becomes apparent that as the atomic number increases there is a certain ratio of atomic number to mass number for which the disruptive force is the least. Thus for each atomic number—i.e., element—there is a mass number (isotope) which is most stable. A plot of atomic numbers versus mass number for these most stable configurations gives a curve known as the beta stability curve.

A nucleus of a heavy element which has an excess or deficiency of neutrons will remedy the situation by undergoing beta decay. This accomplishes two things: the nucleus moves closer to the curve of beta stability and it becomes a new element. It should be noted that a number of beta decays may be necessary before beta stability is reached.

Even though beta stability is achieved, this does not mean that the nucleus will not undergo further decay by alpha emission or spontaneous fission. In fact, one of these will inevitably occur until a stable configuration is finally reached. Which one will occur is dependent on the relative half-life for that mode of decay. For that matter, a nucleus may be beta unstable but decay first by alpha emission or spontaneous fission because the half-life of one or both of these processes is significantly shorter than that for beta decay.

Although there is a finite probability that spontaneous fission will occur in all of the heavy elements, this process does not begin to play a significant role until element 98 is reached. Some indication of spon-

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taneous fission half-lives can be obtained from the relationship of the binding forces to the disruptive forces. The forces are proportional to $A^{2/3}$ whereas earlier, the disruptive force caused by proton-proton repulsion within the nucleus was given as proportional to $Z^2/A^{1/3}$. Thus the spontaneous fission half-life should decrease as $(Z^2/A^{1/3})/A^{2/3}$, or Z^2/A, is increased.

As the atomic number increases then, the likelihood of spontaneous fission within a short time interval becomes increasingly great. It is possible that the shortness of spontaneous fission half-lives may be the limiting factor in the synthesis of new heavy elements.

Heavy elements are formed when high mass number target nuclei bombarded with neutrons or protons or aggregates of the two absorb one or more of the impinging nucleons. There are three methods by which heavy elements can be synthesized. The fastest of these—neutron irradiation in nuclear detonations—is symbolized by brute force, whereas the slowest—neutron irradiation in high-flux reactors—is more a matter of patience. The third—target bombardment by protons or heavy ions in particle accelerators—is characterized more by finesse than by time.

Each method has its own special advantages and disadvantages. I'm sure, for example, that anyone with any imagination at all can picture a few of the disadvantages of a nuclear explosion. As I shall point out though, nuclear explosions have one very distinct advantage when it comes to making heavy elements.

Dr. Glenn Seaborg, a man intimately connected with the discovery of nine of the heavy elements, has noted that nuclear fission was discovered as a result of an early attempt to create transuranium elements, while the first discovery of a transuranium, or heavy, element occurred as a by-product of studies of the fission process.

The discovery of element 93, neptunium, came about in the spring of 1940 because there was no other explanation for one of the radioactive products formed when uranium was irradiated with neutrons. The neutrons were produced by means of a 60-inch cyclotron on the Berkeley campus of the University of California.

This same cyclotron was used in the discovery of plutonium (94), curium (96), berkelium (97), californium (98), and mendelevium (101). (Numbers in parentheses are atomic numbers.) Americium (95) was first made in a reactor.

Accelerators such as the 60-inch cyclotron and the heavy ion linear accelerator (HILAC) at Berkeley have been so successfully used in the discovery of heavy elements because they offer precisely controlled experimental conditions. The general procedure has been to bombard the heaviest available target

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elements with protons, alpha particles, or heavier ions—depending on what one is after.

A disadvantage is that the bombarding particles—particularly the heavier ions, such as boron and carbon nuclei used in the HILAC—must be accelerated to high energies to overcome the coulomb forces in the target nuclei. The more protons in the bombarding ion, the higher the accelerating energy must be. Since the energy carried by this ion contributes to the overall excitation energy of the new nucleus formed, this has a direct effect on half-life. The higher the excitation energy, the greater the probability that the excited, or compound, nucleus newly formed will undergo almost instantaneous spontaneous fission.

An easier—but not nearly so adaptable—method of producing heavy elements is neutron irradiation in reactors. Since neutrons have no charge, they can easily enter the positively charged nucleus of a target atom and thus raise its mass number. The ensuing beta decay then transforms the nucleus into a new element.

Since neutrons carry only one unit of mass, reactor irradiation to form the heavier elements is necessarily a step by step process. If one remembers that the heavy elements are all unstable—with decreasing half-life with increasing atomic number—then it becomes apparent that a point is reached where reactors can no longer be used for the synthesis of still heavier elements. This point is around element 100 (fermium).

The rate of production—and hence the amount—of nuclides in a reactor is strongly influenced by the neutron flux within the reactor. A modest increase in flux produces major increases in the rate of production of nuclides that are made by successive neutron capture. Since in the production of higher mass number heavy elements a strong competition exists between neutron absorption and radioactive decay, high neutron flux is extremely desirable.

One of the problems in attempting to synthesize still heavier elements is obtaining a sufficient quantity of einsteinium (99) and fermium (100) to be used as targets in heavy ion bombardment. The heavy element targets used in the successful synthesis of elements 101, 102, and 103 were all produced by neutron irradiation in reactors.

In March 1965 a reactor at the Atomic Energy Commission's Savannah River Laboratory, near Aiken, South Carolina, began operating at a thermal neutron flux of 4.2×10^{15} neutrons/cm^2 sec, the highest sustained flux yet achieved. (A thermal neutron is one which has about the same mean kinetic energy as a molecule at 15°C.)

The Atomic Energy Commission has begun a "national transplutonium production program" designed

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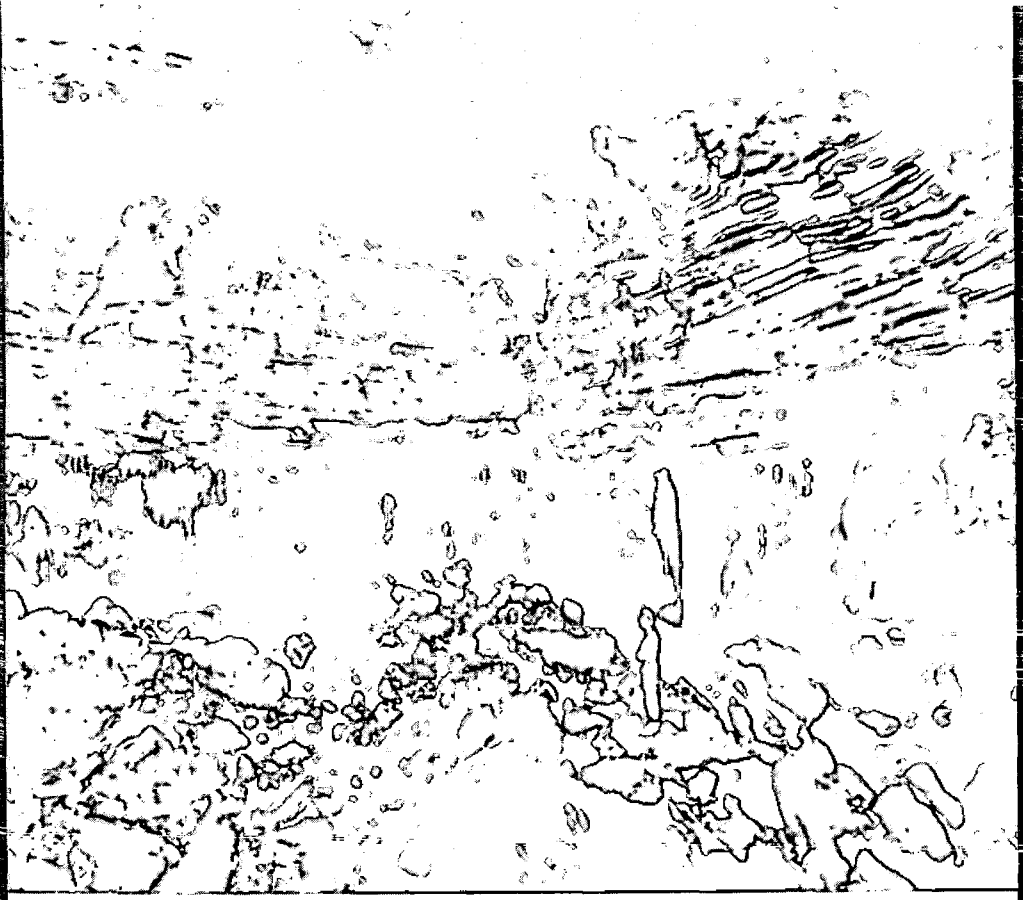

Lawrence Radiation Laboratory

Cavity produced by the Gnome experiment near Carlsbad, New Mexico, in 1961. The mass of debris that fell from the ceiling enormously complicated the recovery of isotopes formed in the explosion.

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to produce elements heavier than plutonium in much greater quantities than heretofore possible. The first step in this program is the irradiation of some twenty kilograms of plutonium 239 with neutrons from one of the very large production reactors at Savannah River. This irradiation is expected to produce ultimately about two kilograms of useful isotopes consisting primarily of plutonium 242, americium 243, and curium 244. (The numbers after the name of each element refer to the total number of protons and neutrons in that particular isotope of the element.)

At periodic intervals several hundred grams of the plutonium 242,

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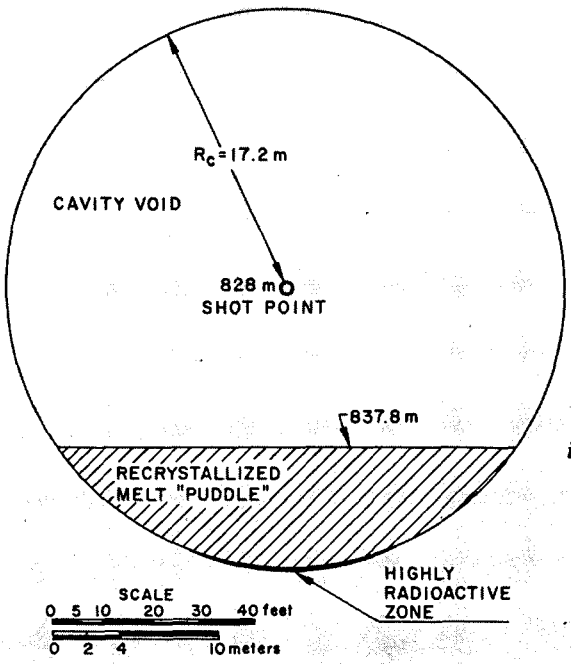

Artist's sketch of cavity produced by Salmon event. Debris from the nuclear device is concentrated in the recrystallized melt "puddle."

americium 243, and curium 244 will be shipped to Oak Ridge and placed in a special High Flux Isotope Reactor (HFIR) for further irradiation with neutrons. This hopefully will produce gram quantities of element 98, californium, hundreds of milligrams of element 97, berkelium, tens of milligrams of einsteinium, element 99, and about a milligram of element 100, fermium, from each 200-gram lot.

The smallness of these quantities can perhaps best be understood in terms of pounds and ounces. Twenty kilograms are roughly equivalent to forty-four pounds. There are 453.6 grams in a pound. One milligram is equal to about three one-hundred thousandths of an ounce.

Obviously the heavier synthetic elements are not going to be produced in any great quantity in this fashion. In fact, the ultimate yield of californium 252 will only be about 60 grams or 0.3 per cent of the starting material, plutonium 239. This is not too surprising since thirteen successive neutron captures are required to transmute plutonium 239 into californium 252.

The HFIR facility probably will

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not be able to produce any new elements because of the short half-lives of elements 101, 102, and 103. Isotopes of these elements decay almost as fast as they are formed.

Since reactor irradiation does not seem likely to produce new elements, or, for that matter, much heavier isotopes of the existing elements, the AEC is seriously considering using a thermonuclear explosion for this purpose. The advantage of a thermonuclear explosion over a nuclear reactor for making heavy elements is that neutron capture proceeds so rapidly that short-lived isotopes do not break the production chain.

As a part of the Plowshare program to develop the peaceful uses of nuclear explosives, an active attempt is being made to perfect a special thermonuclear device for the purpose of producing heavy elements. This device would be exploded deep underground in a natural salt formation near Carlsbad, New Mexico.* By means of quick sampling techniques, it is hoped that samples of radioactive debris can be gathered and analyzed within seconds after the explosion. With luck, and if the analytical procedure is sufficiently rapid, elements 104 and 105 may be identified as components of the debris.

A properly designed thermonuclear device can be made to produce tremendous quantities of neutrons within microseconds (millionths of a second). The neutron flux from these devices is so large that it is commonly measured in terms of moles, where a mole is defined as 6.023×10^{23} neutrons.

Mike, which was the first thermonuclear detonation, had a yield over 10 megatons—equivalent to the detonation of more than 10 million tons of TNT. The shot was not for the purpose of producing a large thermal neutron flux, but the fact that it did and thus created two new elements from the uranium in the device came as a most pleasant surprise.

Par and Barbel, two of the most recent shots in the AEC's program to develop a device for producing heavy elements, are major improvements over Mike. Par had a yield of 30 kilotons—equivalent to 30,000 tons of TNT—and produced twice as many neutrons as any shot theretofore detonated in the program. Barbel had a yield of about 5 kilotons and produced a neutron flux similar to that of Par.

Not only are the neutron fluxes produced in Par and Barbel better than any heretofore available, but their low yields mean that future detonations with devices of this type can be completely contained underground—as indeed Par and Barbel were. This is important for

*According to the AEC's Annual Report to Congress for 1964, there are no present plans to proceed with this project, code-named Coach, pending 1) further development of a nuclear explosive with sufficiently low yield to be safely detonated at the Carlsbad site, and 2) further definition of requirements for heavy elements.

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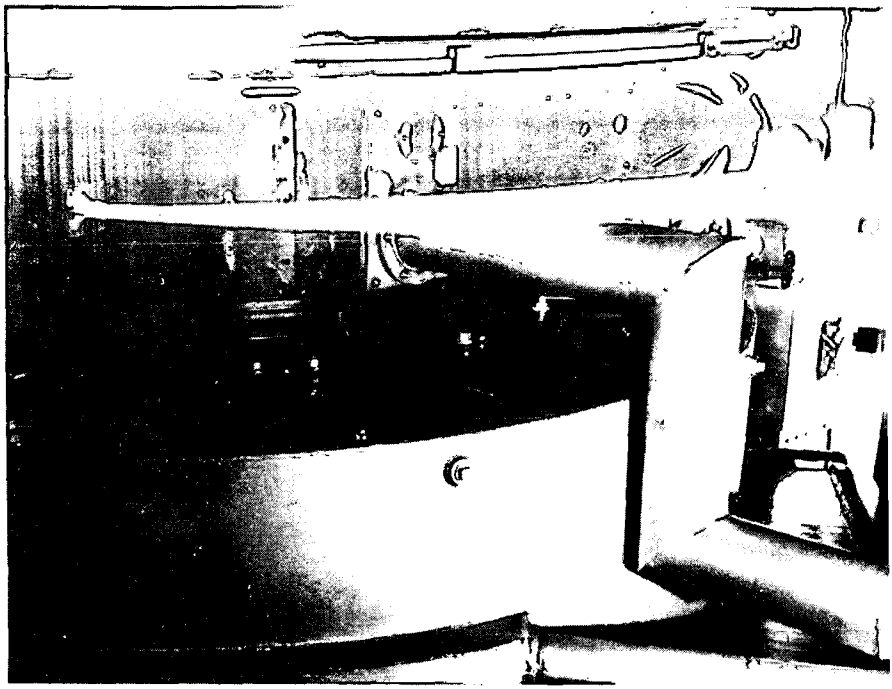

two reasons: First, it means that there will be no radioactivity released to the atmosphere to cause problems within the context of the nuclear test ban treaty. Secondly, the debris from the explosion is concentrated in a relatively small volume underground. Unfortunately, as we shall see, this volume in the past has not been nearly as small as the radiochemists would like.

One of the problems thus far with neutron irradiation in nuclear explosions has been the difficulty in recovering a sufficient amount of the target material within a short time (less than a week) to permit isolation and detection of new nuclides. Unless the recovery is made within this period, the short half-lives of many of the heavier nuclides preclude their detection. In a typical underground experiment at the Nevada Test Site, only about 10^{-10} (one-tenth of a billionth) of the target is reclaimed. This means that extremely sophisticated radiochemical techniques must be used if the search for new nuclides of the heavy elements is to be successful.

When a device is detonated in a contained underground explosion, the target material is instantly va-

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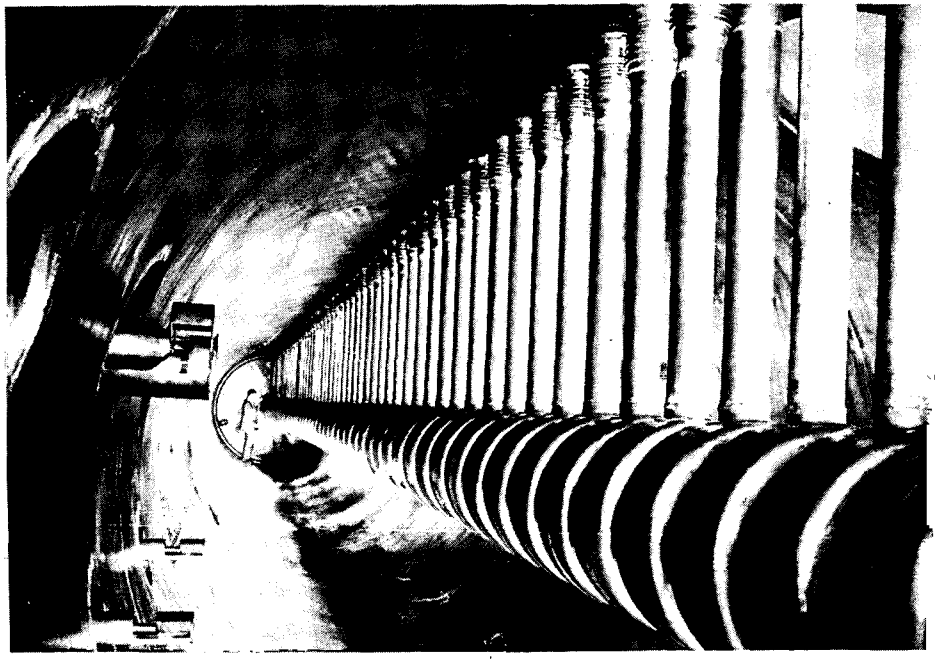

The Lawrence Radiation Laboratory

(Left) Particle beam from the 60-inch cyclotron used in the discovery of six of the heavy elements.

(Above) The interior of the heavy ion linear accelerator used in the first synthesis of elements 102 and 103. Heavy ions such as carbon, nitrogen, oxygen, or neon are accelerated through the doughnut-shaped "drift tubes" which extend the length of the vacuum tank.

porized, although not before being irradiated by the tremendous neutron flux. The vaporized target then forms a part of the expanding cavity gas. When the cavity has expanded to its maximum dimensions, the target material is intimately mixed with the melted rock lining the cavity walls. Being very hot and liquid, this melted material—or melt as it's more commonly called—flows down the walls and forms a pool at the bottom of the cavity.

Unfortunately, at Nevada the cavity almost invariably collapses within a short time after it reaches its maximum dimensions. The end result is that literally thousands of tons of rock get mixed in with the melt containing the remains of the target material—and, for that matter, all that remains of the device

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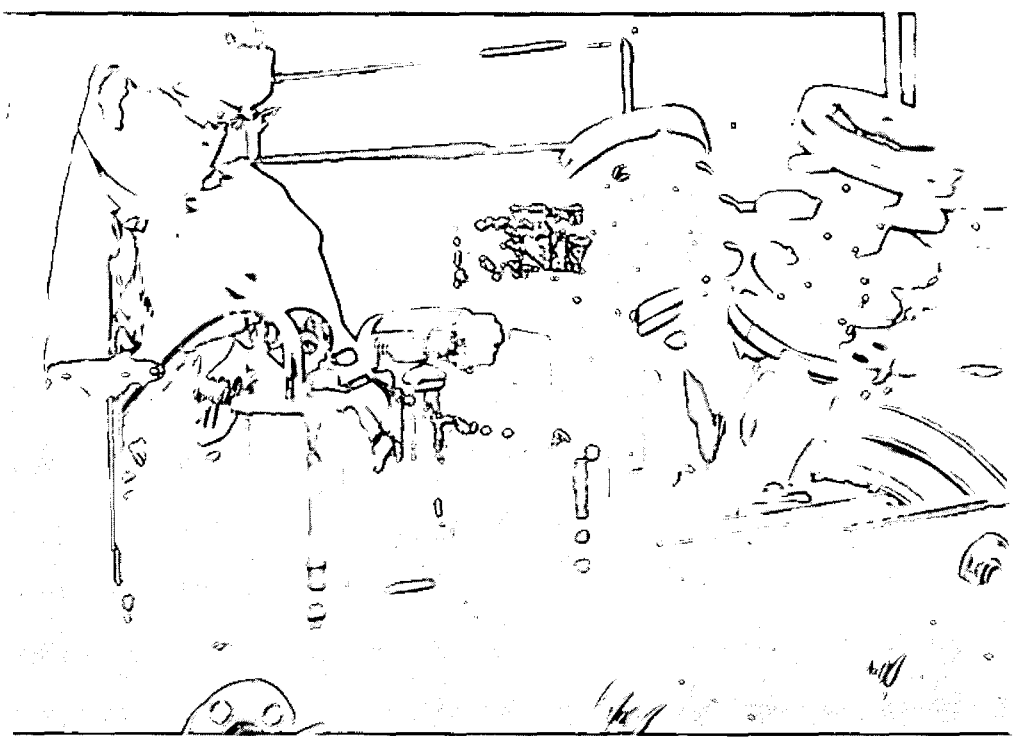
itself. Even in the rare instance where the cavity remains standing —as has the cavity formed by the Gnome device at Carlsbad, New Mexico, in 1961—massive chunks of the ceiling fall into the melt, thus diluting it considerably. This serves only to make life a little less bearable for the radiochemists responsible for analyzing the melt material.

That was the situation until October 22, 1964, when the Salmon detonation occurred as a part of the Vela Uniform program to improve the capability to detect, locate, and identify underground nuclear explosions. Salmon was a 5-kiloton detonation at a depth of 2,700 feet in the Tatum Salt Dome twenty miles southwest of Hattiesburg, Mississippi. Salmon had nothing whatsoever to do with the heavy element program, but nonetheless provided important information.

The significant fact about Salmon was that it formed a perfectly spherical cavity, 65 feet in radius, that did not collapse. Not only did it not collapse, but no debris whatsoever fell into the pool of melt at the

Argonne National Laboratory



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bottom of the cavity. Core samples of the melt provided the largest fraction of device debris ever obtained from an underground shot in this country. This has obvious implications for the recovery of heavy elements formed by nuclear explosions.

The successful production and discovery of elements 104 and 105 by means of a nuclear detonation might thus be achieved in the following manner. A special nuclear device, with a yield of 10 kilotons or less, would be detonated in a salt formation similar to the Tatum Salt Dome. In order to detect the presence of very short-lived isotopes of elements 104 and 105, the emplacement room for the device would be connected by means of an open pipe to a sampling plant at the surface. This open pipe is called a line-of-sight because it provides a direct view from the explosion to the surface. Hopefully, before the force of the explosion causes the pipe to seal itself off, some of the vaporized target material will have been driven up the pipe and collected in the sampling facility.

Since the half-lives of any 104 and 105 isotopes present will probably be very short, some sort of physical detection system would be used. For example, the mass of the heaviest isotopes might be measured by means of a mass spectrograph. This is a device which subjects ionized molecules or atoms to a magnetic field which causes them to trace paths of different curvature depending on their mass. Means might also be provided for rapidly collecting the decay products of the 104 and 105 isotopes and measuring their radioactivity.

As soon as possible after the shot, drilling would begin to obtain core samples of the melt puddle in the bottom of the cavity. These cores would be drilled within forty-eight hours after the shot and immediately analyzed by both physical and radiochemical means for any new nuclides that might be present.

In the Par and Barbel experiments heavy nuclei up to a mass number of 257 were produced. The heaviest identified isotope was fermium 257. This isotope is thought to result from nineteen successive neutron captures in the uranium 238 targets, followed by eight beta decays to bring the atomic number up to 100.

There is some evidence to indicate that not all the heavy isotopes formed in these two shots came from multiple neutron capture in uranium 238. Rather, it may be that some of the uranium was transformed to element 91, proactinium,

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This electromagnetic isotope separator is so sensitive that it can separate isotopes differing in mass by only the weight of a single proton or neutron. This instrument is used in the search for new heavy elements and isotopes in the debris of thermonuclear explosions.

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and element 93, neptunium, and that these in turn underwent multiple neutron capture.

There are two ways in which the chances of synthesizing new heavy elements might be further enhanced. One is by increasing the neutron flux still more and the other is by using a heavier target material such as plutonium 242. There is some hope that enough californium 252 may be produced in the High Flux Isotope Reactor to serve as a target. If californium can be used as a target, the chances of producing 104 and 105 would be greatly increased.

Nonetheless it still seems certain that only very small quantities of new elements or isotopes will be formed. Thus the procedures used to separate and identify these nuclides take on added importance.

Four AEC laboratories—the Lawrence Radiation Laboratory at Livermore and Berkeley, California (although they are both called the Lawrence Radiation Laboratory, these two sites are for all intents and purposes different laboraotries), the Los Alamos Scientific Laboratory in New Mexico, and the Argonne National Laboratory in Illinois—are engaged in a program to separate and identify heavy elements created in the debris from small underground thermonuclear explosions. The thermonuclear devices used in these experiments are designed at Los Alamos and Livermore.

The fact that heavy elements at atomic number 98 and above undergo significant amounts of spontaneous fission, whereas such fission occurs only rarely at lower atomic numbers, can be used as a quick and dirty means of determining whether heavy isotopes of interest were formed. If fission detectors show the presence of californium 254 (element 98) in the debris from an underground shot, then the explosion is considered a "good" one and a search is begun for heavier elements and isotopes.

The first step is to separate the actinides from the rest of the debris and rock within the core sample. (Actinides are the series of elements beginning with element 90, thorium, and extending through element 103, lawrencium. The series includes all the heavy elements thus far synthesized in this country.) This can be done rather simply through gross chemical techniques; the real problem is separating and identifying each separate actinide.

Thus far, the chemical separation of the heavy elements has been done almost entirely through ion-exchange techniques. In a typical ion-exchange method, the mixture of actinides passes through a rather long tube packed with granular ion-exchange resin. As the mixture passes through the tube, the ions of each element repeatedly associate and disassociate with the resin.

Elements of higher atomic num-

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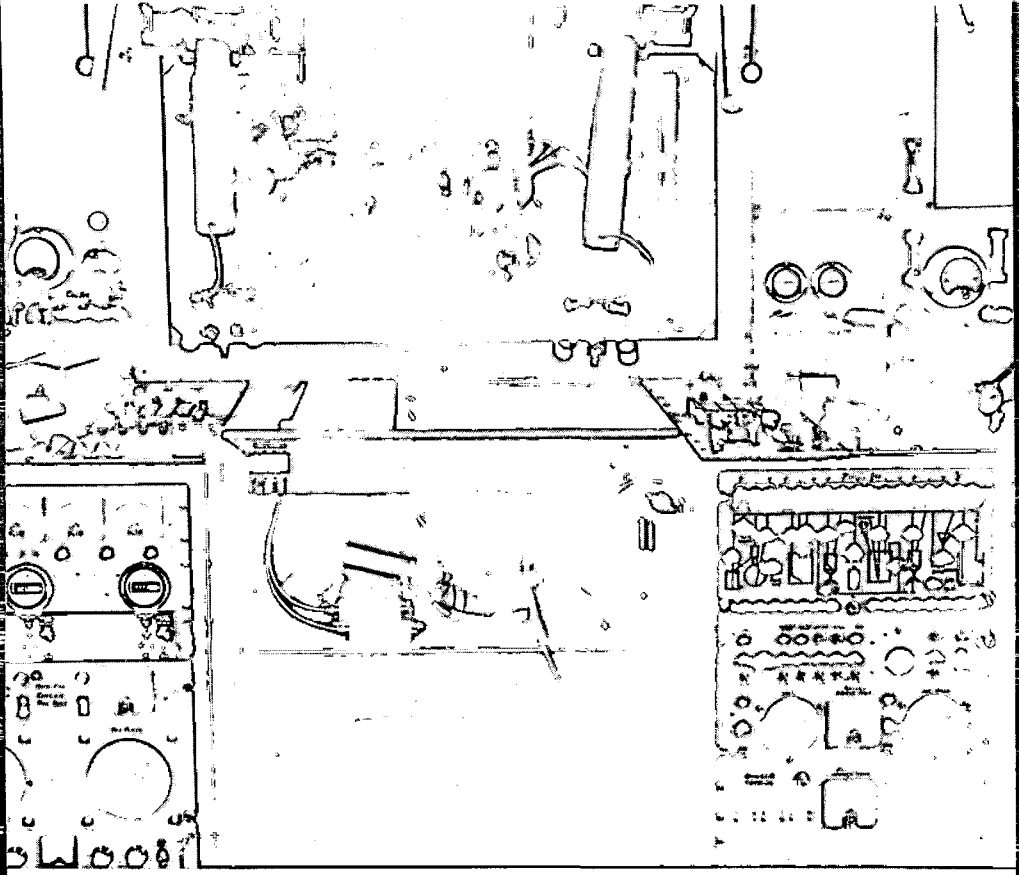

Lawrence Radiation Laboratory

Hot cell used to handle heavy elements. Because of the radioactivity of these elements they must be handled remotely by means of the manipulators shown. The glass window is over 30 inches thick. A complete laboratory for processing and identifying the various elements is set up inside the cell.

ber tend to pass through the resin more rapidly than do elements of lower atomic number. By this means the individual elements can be separated and identified, since the liquid leaving the tube is collected drop by drop and analyzed for its chemistry and radioactivity.

The last remaining step is to identify the various isotopes present. One of the most sensitive instruments used for this purpose is the 100-inch mass spectrometer at Argonne. This instrument is capable of detecting a quantity as small as 5×10^{-17} (0.000,000,000,000,000,050) grams.

Sensitive as this instrument is,

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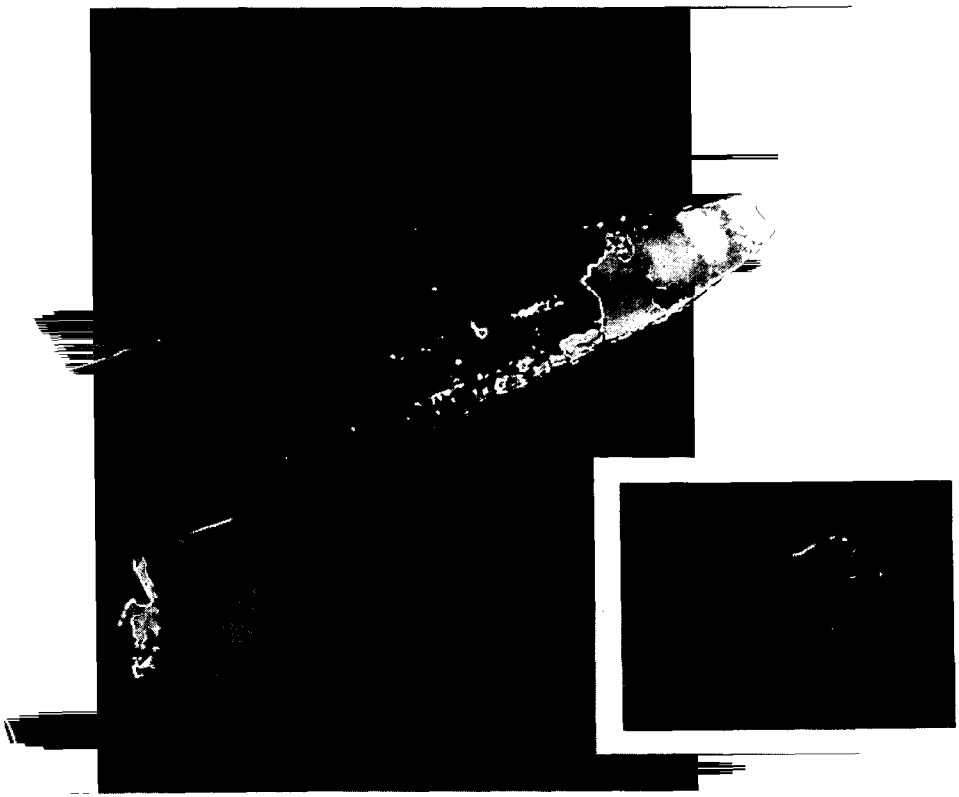
isotopes are sometimes present in quantities too small for it to detect. These isotopes can often be identified by their radiation characteristics, such as type of radioactivity, the energies of emitted particles or rays, and the decay rate of the isotope. Since almost everything contains some radioactive material, these measurements must be carefully made with equipment shielded from outside radiation.

In some cases, it is not possible to distinguish the individual nuclear characteristics in a mixture of isotopes. When this happens, scientists at Argonne make use of an electro-

This is a color print of 70% of the world's supply of berkelium as of June 1964. The photo is magnified about fifty times so there's really not much of the stuff around. The insert in the lower right-hand corner is the berkelium photographed by its own self-luminescence.

Lawrence Radiation Laboratory



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magnetic isotope separator, capable of separating, almost completely, isotopes differing by only one mass unit in weight. This instrument can be used to effectively separate mixtures of only a few hundred atoms.

Two of the heavy elements, neptunium and plutonium, have been manufactured quite literally by the ton. Of the ten remaining, however, five have actually never been seen. Because of their short half-lives there is little reason to believe that elements heavier than mendelevium will ever be produced in quantities visible to the naked eye.

Why then go to such extreme measures as nuclear detonations in order to produce them? Primarily to provide a fuller understanding of the chemistry and physics of all that surrounds us. Studies of the heavy elements have significantly increased knowledge of the stable elements, the fission process, and the origins and history of the earth, the stars, and the universe.

Insofar as is now known, element 103 completes the actinide series. Elements 104 through 118 are predicted to be analogous to elements 72 through 86 (hafnium through radon). If this is true, element 104 should resemble hafnium, element 105 tantalum, et cetera. One of the strong justifications for producing elements 104 and 105 is to discover if this prediction is correct.

Unless the present trend in half-lives is reversed (and there is some slight indication that it might be), however, the question will remain academic, for there simply will not be enough of these elements produced to make a detailed study of their chemical properties possible.

As noted earlier, spontaneous fission of the heaviest elements is of great importance since in most practical cases it sets a limit for the stability of heavy nuclei. Because of this, it is extremely desirable to be able to predict the spontaneous fission half-lives of as-yet unsynthesized nuclei.

The half-lives for beta and alpha emission for many of these nuclei can be fairly well predicted. However, the spontaneous fission rates of nuclei produced thus far have been found to vary in a most irregular fashion. A theory has been proposed which seems to account for these fluctuations. This theory is of interest because it also seems to predict that relatively long-lived isotopes may exist beyond fermium and that nuclear explosions may be able to make them.

One of the first bits of experimental evidence to support this prediction was the recent discovery of the isotope fermium 257 which has a half-life of eighty days.

Nonetheless, it seems likely that a point will soon be reached where the shortness of spontaneous fission half-lives will preclude the formation of new elements. To paraphrase some famous words written about Kansas City, "we've gone about as far as we can go."

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THE HEAVY ELEMENTS

Atomic Number	*Element*	*Symbol*	*Atomic Weight**	*Date of Discovery*	*First Synthesis*
93	NEPTUNIUM	Np	237	1940	Irradiation of uranium with neutrons
94	PLUTONIUM	Pu	242	1940-41	Bombardment of uranium with deuterons
95	AMERICIUM	Am	243	1944-45	Irradiation of plutonium with neutrons
96	CURIUM	Cm	248	1944	Bombardment of plutonium with helium ions
97	BERKELIUM	Bk	249	1949	Bombardment of americium with helium ions
98	CALIFORNIUM	Cf	249	1950	Bombardment of curium with helium ions
99	EINSTEINIUM	Es	254	1952	Irradiation of uranium with neutrons in first thermonuclear explosion
100	FERMIUM	Fm	253	1953	Irradiation of uranium with neutrons in first thermonuclear explosion
101	MENDELEVIUM	Md	256	1955	Bombardment of einsteinium with helium ions
102	NOBELIUM**	No	254	1958	Bombardment of curium with carbon ions
103	LAWRENCIUM	Lw	257	1961	Bombardment of californium with boron ions
104	————	—	260	1964	Bombardment of plutonium with neon ions

* *Mass number of longest lived or more available isotope.*
** *There is considerable controversy about this name since it was given by a group that made an erroneous announcement of the discovery of 102.*

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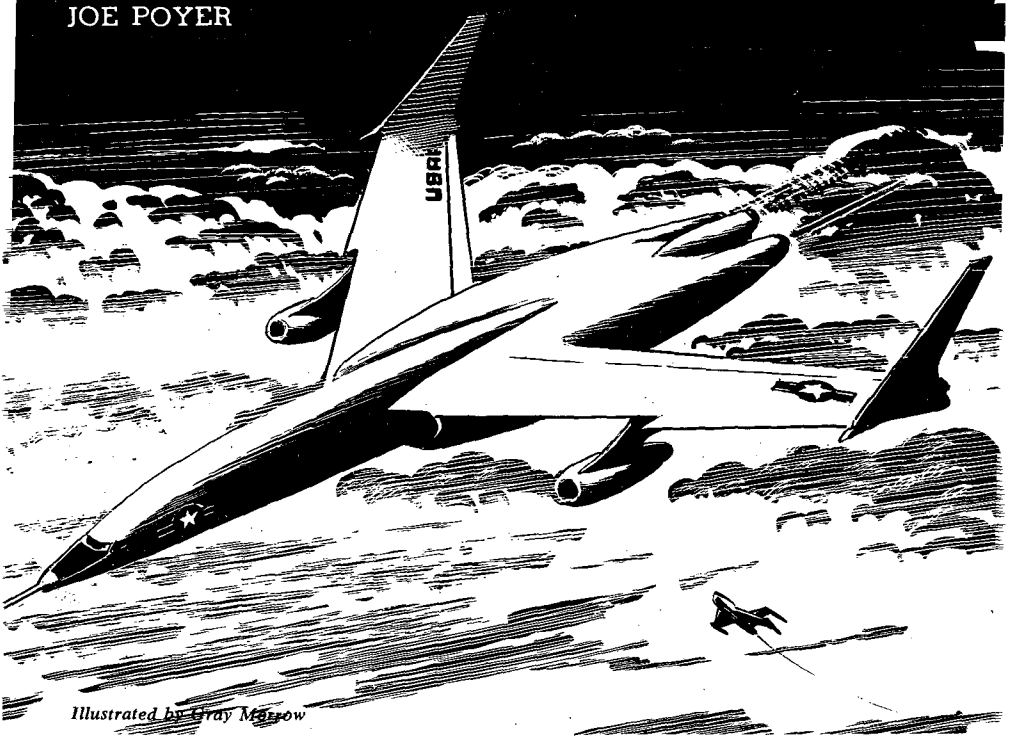
MISSION "RED CLASH"

The game was the same—deadly!—
whether played twenty miles up,
or in a howling Artic blizzard at sea level.
Information Retrieval—the military type—
isn't something done in libraries
with "Quiet!" signs all around.

JOE POYER



Illustrated by Gray Morrow

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Fifty-eight degrees of frost. Twenty-six below zero F.°

At two-hundred thousand feet, the surface of the earth below was void of all but large geological features. To the east, and falling rapidly behind, the vast clear reaches of Western Siberia lost themselves in the milky haze flooding the horizon. To the northwest, the contrast was startling. Stretching far into the Arctic Ocean, the northeastern swell of the Scandinavian Peninsula was covered by a huge storm that built as Teleman watched. He made a course correction and felt the plane bank, its gulping turboramjets running up with a steady murmur.

He checked his instrument panels —air speed, course, engine temperature, fuel, contact-point countdown, ambient temperature, metal flex, accumulators, liquid oxygen, batteries, hydraulics, altitude, trim, generators, cameras . . . a hundred-and-one items checked themselves green on the boards.

Teleman lay back and relaxed in the acceleration couch, letting the languid feeling brought on by the relaxant drugs clear itself out of his system. At Mach 1.5 he was slightly more than one hour from contact—right on time so far.

The reconnassiance plane droned on across the roof of Soviet Russia, heading for the Arctic Ocean and rendezvous with the U.S. Navy cruiser that would relieve him of his cargo of precious military information. The encoder clicked softly as a new set of co-ordinates came in from the complex of SAMOS satellites, advising him of a particularly suspicious ground location. One of the satellites had observed a small area of low-level infra-red radiation where none had existed before. The location was in the vicinity of Magnitogorsk, the center of Soviet electronics research, and he programmed it for his next sweep.

Now it would be a milk run until he orbited the ship. Beneath his plane he could see the cloud-covered Arctic coast as his radar knifed through the clouds to lay the pattern of the land below. Infra-red dropped lower and lower on the scale; the white, washed-out picture was highlighted here and there with sharp black dots and patches as the warmer formations jumped out of the blizzard and storm below.

Ahead, he began to make out the identity pattern of the cruiser on his scope, the contact point on this portion of the mission.

Forty degrees of frost. Eight degrees below zero F at sea level.

The nuclear powered *John F. Kennedy* came around sharply, bows on to the gale winds; her screws churning furiously, she clawed her way up a towering wave rising twenty feet above her superstructure, then rocketed down into the trough. The bow smashed deep into the green Arctic Ocean. Tons of

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water sprayed over her decks mast high, turning instantly to ice that rattled against the bridge like cannon shot. From a distance, the cruiser resembled a singularly stubborn, wave-tossed cork.

Fifty- to seventy-foot waves, whipped to a froth by the Arctic gale winds marched down from the Barrier across two hundred miles of open sea. What was possibly the worst Arctic gale in more than twenty years had formed from a Katabiatic storm somewhere on the interior of the Greenland ice cap and was now sweeping in a great cyclonic arc across the Greenland Sea and up into the Barents Sea.

Lieutenant Folsom swiveled on his high seat as Captain Larkin came onto the bridge, peered out through the driving wipers and shuddered. Folsom indicated the coffee and chuckled to himself as Larkin poured and gulped the steaming black liquid.

"How's she look, Pete?"

"A real ball coming up, Captain. The wind is about seventy-five knots and rising. The barometer is twenty-six point three and still falling—fast!"

"Anything come in over the weather channel?"

"Thule says a 'real' storm is building this time. That little breeze two days ago only a prelude. They expect at least one hundred twenty-five knots of wind, possibly higher for this area, in the next twenty-four hours."

"Ah . . . my aching back. How long until contact?" Larkin peered at his watch and checked the read-out panels above the control console.

"Five minutes to go. Communications tells me everything is set. There shouldn't be any trouble on this end." Folsom slid out of the seat and walked over to where Larkin was leaning against the port coaming, staring out into the wind- and wave-filled night. The ship crested another wave and tipped, slid and smashed again into the Arctic seas.

"Thule also said that we can expect snow towards the end. It's one of those blasted Greenland storms and when this one finally spilled over the edge of the Greenland glacier, it found a low pressure area along the coast and kept coming."

Larkin grunted. "Helmsman, what's our course and speed at the moment?" he called over his shoulder.

"Zero two six at sixteen knots, sir."

"Sixteen knots against these head winds, not bad. Let's cut her back to ten, that should reduce the pounding on the bow section somewhat. I don't want any more pressure on the bow section patch-up than we absolutely have to have."

The screen door swung open with a bang and a fur-shrouded figure stumbled in, followed by the banshee shriek of the wind. A

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howled chorus of "shut the door" sounded. Abruptly, the shriek ended and Lieutenant Bridges leaned wearily against the hatch and stripped his Arctic mask carefully from his face. The mask and his all-weather gear were coated almost solid with ice.

"Where's some coffee for a dying man," he demanded.

Larkin poured coffee for him, "Anyone else out there?"

"No, sir, I sent them in twenty minutes ago."

"Good, there's no need to stand watch outside, you can't see anything anyway."

"Amen. Your eyeballs freeze."

Larkin turned at the buzz of the intercom. Folsom picked it up and listened briefly. "Communications is set, shall I have him pipe it up here?"

Larkin nodded and dug out his cigarettes and offered the pack around. They lit up and made themselves comfortable as the radio operator began his call on the ultra-tight VHF scrambled frequency.

"Got 'im, sir."

"Beatle to Target 1 . . . I read your . . . signal . . . five by five . . . stand . . . by . . . for . . . transmission."

The characteristically drowsy voice of the reconnaissance pilot came through on the VHF channel clearly, in spite of the storm and havoc raging outside. Larkin glanced quickly at the banks of tapes to make sure they were all

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running, and took a long drag on his cigarette.

High-frequency chatter sounded briefly over the loud-speaker. The tape decks spun madly and the bridge echoed to the tortured squeal of telemetry.

"Transmission complete . . . Fuel load low . . . proceeding to refueling . . . point . . . at minus thirty-five minutes . . . everything working . . . like a . . . charm . . . no . . . trouble from the . . . Reds. Antidetection . . . gear works fine."

"Looks like you won't be returning to base for a while," Larkin commented. "We have new orders for you in a supplementary transmission coming up. I have been instructed to tell you that you are to review them after refueling. We will remain on station here, waiting for you to report. The mission should be complete by 1800 tomorrow. You will rendezvous with us tomorrow night, same location."

Larkin finished the instructions and motioned for the radio operator to transmit the data to the circling aircraft.

Teleman acknowledged the transmission and receipt. He was rather puzzled. This did not sound like a routine patrol; the last of this watch before returning to base.

From sixty-thousand feet, the Arctic Ocean below was hidden by whipped gray clouds that churned in their upper layers. The late afternoon sunlight was filtered to a dull gray by a thick blanket of high-flying ice crystals. The sun, near the horizon, dipped below the rim of storm clouds and immediately the light turned a somber gray; deathly solid in its low intensity.

"Looks . . . awfully rough . . . down there . . . you be able to hold . . . through that . . . stuff?"

"I don't anticipate any real trouble," Larkin replied. Bridges rolled his eyes to heaven in supplication.

"So far, it's nothing we can't handle." Privately though, Larkin was worried. Although the *JFK* was new and built to more exacting specifications than any other ship in history, the storm they were running into was nothing to fool with.

The weather satellite picture that had come in just prior to contact, showed the entire Arctic region and the northernmost part of the North Atlantic in for one of the worst storms in years—from all appearances, worse even than the Great Storm of 1942, the Arctic gale that played so much havoc with allied convoys caught in its path and considered the worst recorded in Arctic history. And the *JFK*, on station three hundred miles north of Norway's North Cape and some six hundred miles west of Novaya Zemla, was directly in its path.

That 1942 storm had sunk two ships—although smaller than the

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JFK and underpowered, even for their day—you did not lightly take any man-made object with all of its inherent frailties into the very teeth of nature at her worst without some apprehension.

"We'll be here," he said with considerable more confidence than he felt at the moment. The seas were still picking up and the stabilizers were just about useless. "We are going to start quartering a fifty-mile circuit in fifteen minutes"—out of the corner of his eye he saw Folsom move to the plotting table and begin working—"so we'll be here."

"Good . . ." the transmission garbled and quickly cleared.

"Say again," Larkin requested.

"Good . . . take it easy . . . down there . . . see you tomorrow."

"Right, clear." Larkin stubbed his cigarette out and joined Folsom at the plotting table.

Teleman banked and fell off to the north at a leisurely pace, heading for the refueling point. Beneath him, the storm-filled Arctic Ocean gave way to the frozen wastes of the great ice barrier creeping south at an ever increasing rate as the season advanced. Crumpled and torn, the jagged edges of ice near the rim, twisted and warped by the pressure of millions of tons of slowly moving ice from its vast interior, threw blinding sheets of minute ice crystals. The crystals filled the air to a height of twenty feet with fiery, needle-sharp spicules screaming through the pressure ridges and hummocks, carving them into tortured shapes.

Teleman climbed slowly to eighty thousand feet and held. Here the air, what there was of it, was quiet, knifing past the razor-sharp edges of his half-extended wings. Ahead, the forward edge of the storm appeared and soon he could see the gray shapes of the ice surface below. The low Arctic sun suddenly broke through the edge of an ice-crystal cover and flooded a two-dimensional pyramid of burnished ice with blood, reaching away to the horizon. The sunlight shining through the small observation slit to his right carried no warmth, only a cold glare.

His radar showed a blip that quickly resolved itself into a KB-58 tanker. The graceful craft pulled past his nose in a tight turn and took up station ahead and above. The boom was out of the KB-58 and he maneuvered slowly, bringing the plane up and just off the boom. Teleman watched it waver, judging the right moment, and then increased power slightly and the nozzle slipped into its housing aft of the cockpit. High pressure pumps forced liquid hydrogen into the tanks.

After three minutes the refueling process was complete and he broke away. Answering the KB-58's cocky rocky wings, he settled

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into an orbiting pattern and digested the contents of the taped orders. The KB-58, its load gone, disappeared towards its Alaskan base. Teleman leaned back and began to review the contents of the tape. Suddenly he sat up against the harness and swore softly. His orders amounted to international blackmail on a grand scale, to say the least.

From all outward appearances, the Soviet Union and the United States were moving toward rapprochement in the face of growing Red Chinese incursions into Southeast Asia, Africa, and Central Siberia. Both sides found it impossible, however, to relax surveillance while they remained "eyeball-to-eyeball" as the phrase had it, over their respective positions—both BMEW's and missile—in the Arctic.

His orders directed him to fly to the Sinkiang-Kazakh border. The Red Chinese were reported to have attacked along this border and both sides were extremely quiet about the fighting. The war was being conducted on a nonnuclear basis; a sort of gentleman's agreement, although Teleman found it hard to think of two less likely candidates.

The Soviets would be at a distinct disadvantage in this set-to. The Red Chinese could mobilize in the field at nearly five times the strength of the nuclear-geared Soviet army.

The State Department and the Pentagon apparently felt that, if the Soviet Union appeared to be on the losing side, it would not take them long to come screaming to the United States for help.

But for the moment, the Soviets did not want it to be known that the much poorer Red Chinese had the effrontery to attack one of the strongest nations on Earth and the leader of World Communism to boot.

Another thought occurred to him as he set up his flight plan for the coming mission. The Red Chinese would certainly not want their involvement with the U.S.S.R. known at the moment for fear the United States would go on the offensive in Africa and Southeast Asia. In all, it was a very poor time for the Chinese to pick on the Soviets. Teleman felt willing to lay any odds that the Russians had initiated this particular fight, realizing finally that they could no longer tolerate the present attitude of the Peking rulers.

His orders directed him to proceed to the war area—the desolate and rugged hills of the northern Sinkiang plateau and border region —some of the worst territory for fighting a war in the world.

"It makes the Dakota Badlands look like a children's playground," he thought.

Teleman programmed the coordinates then settled back as the plane broke out of its orbiting path and headed on a course to inter-

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cept the 90° meridian. He would follow it down at one hundred fifty thousand feet. In the meantime, he had nearly six thousand miles to go and it looked like it would be a long day. He slept.

II

At 23:30 local time, Teleman woke and altered course to the east in a wide sweeping circle that would bring him from the east across the battlefield into the direction of the setting sun. The light would throw objects below into bold relief. The Soviet-Mongolian boundary, lost in the mountain fastness passed beneath as he turned east. The air was remarkably clear and he was able to maintain his altitude without cloud or atmospheric disturbance. The vast Sinkiang plateau slipped silently past and he prepared for his first run. Several minutes and no indication from his sensors of any action below. Teleman was beginning to think that the mission would produce nothing.

Passing over the Irtysh River, he suddenly glimpsed a small patch of infra-red detected heat some thirty miles from the Kazakh border into Sinkiang. It was barely discernible as a shade of gray slightly lighter than the valley surrounding. Teleman pulled around in a tight circle, concentrating on the spot. It appeared to be moving along a narrow roadway about forty-five miles an hour—pretty fast for a military vehicle in this kind of terrain.

A minute passed and it was joined by another, then a third vehicle, farther back up the road. His radar built up a picture of a deep valley with a road running between almost sheer rock walls. Ahead of the convoy, the valley opened up and climbed steeply to a flat plain that butted against a series of rocky foothills. As the trucks reached the spot where the valley widened, artillery opened up from the crests of the foothills. The first truck ran the ranging gauntlet but the second was caught by a burst landing in the road just ahead. The trapped third truck was hit in the concentration of fire that followed swiftly.

There was no doubt about it, Teleman mused. There was a war going on. The only problem was to identify sides and that would be taken care of in Virginia.

Teleman pulled out of the orbit he had been holding during the incident and fell off to the south, looking for troop concentrations and command posts. During the following six hours he systematically quartered the region along the Soviet-Sinkiang border from the town of Shufu to as far east as the Mongolian border, flying 45° tacks that carried him a hundred miles deep into territory on either side of the border.

Teleman's reconnaissance aircraft was unique as he was himself.

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Crammed with the latest possible detection and anti-detection equipment, the plane was nearly one hundred fifty feet long, half again the size of the A-11, and weighing nearly three times as much. The air frame was titanium, with a skin covering of stressed stainless steel.

Plane and pilot were in the air over or around unfriendly territory one hundred forty-four flying hours every watch. To maintain this mission-time, the plane was refueled in-flight every twenty-four hours.

The engines that powered Teleman's A-17 recon aircraft were advanced, supersonic engines to which had been added a fan, special ductburners, powerful afterburners; and the fuel had been changed to liquid hydrogen. These engines operated at turbine temperatures approaching four thousand degrees to obtain the maximum thrust from the fuel. The cryogenic fuel was first circulated through both turbine blades and vanes and then into the huge circular burner.

Again the engines differed radically from earlier fanjets in that for extremely high speeds, the high and low compressor and turbine blades and vanes were mounted on variable stator disks and could be turned edge-on to the air stream. This created, in effect, a ramjet engine. The huge needle-nosed inlet plug extended forward to ram as much of the thin, high altitude air into the burner as possible.

Teleman, thirty-one, weighed one hundred sixty-five pounds, and was in perfect physical and mental condition as defined by the United States Air Force. His uniqueness lay in the fact that he had been trained for nearly ten years to fly this particular aircraft. It had been recognized when the A-11 was being built by Lockheed in the early 1960's, that man had about met his match in high-flying and very fast aircraft. The A-11 was on the threshold of man's ability to control the aircraft for the lengthy mission times now needed. The A-17 was quite aways past.

Teleman and his relief pilot were tailored to fit the aircraft. This was achieved by specially developed hallucigenic drugs that slowed their time sense. The reach the drugs allowed was marginal, yet enough to give Teleman the control he needed to handle his craft as no other airplane had ever been flown. Other drugs kept him awake during the vital portions of his seven-day mission over Red territory. Other drugs caused him to sleep, while still others caused him to wake instantly, kept him at the peak of alertness and his mind focused on the mission, his instruments, and equipment.

Teleman was only a part of the surveillance system. Reconnaissance satellites searched broad reaches of opposition territory every two hours. Their information was channeled to Teleman for im-

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mediate action as needed, or relayed from the ground-tracking stations to an evaluation center in Virginia that also acted as headquarters for these missions. Teleman's function was to fill the gap between the operational SAMOS system and the advanced reconnaissance and surveillance systems that were still two or three years off.

Teleman was completing the final leg, preparatory to shaping a course northeast and rendezvous. He was following the irregular border as defined by a series of star-fix co-ordinates contained in the course tapes, when he caught a tiny flicker on the trailing edge of his radar screen. The blip showed near Pezhevalsk, on the Soviet side of the border.

He lifted the plane, ramjets flaming, and scrambled to two hundred thousand feet. The intruder was still closing. Teleman's radar put him at the center of a sixteen hundred mile diameter circle and the flickering image was still closing. The other must somehow have him visually, Teleman thought.

He was now faced with a dilemma. He could climb to maximum altitude and speed, cutting his perilously thin reserves to nothing and maybe his fuel load to the danger point. He decided to hold off and see what happened.

He was now flying at two hundred ten thousand feet, and was heading due west. Teleman corrected for rendezvous and flew on, watching the intruder below. After five minutes, a second blip appeared and the first peeled off. They looked as if they were going to run him in relays. The second intruder had lost a little ground on the first and began to move up more quickly. After ten minutes he was still closing, but much more slowly now than at first—still some six hundred miles behind.

Teleman released a small ghost image rocket that took up a station tangential to his course, then shot away on its ramjet unit at a sixty-degree angle. Teleman could see its image streaking out of his range, flickering up and down the scale as if trying to jam the enemy radar. It gave every appearance of an aircraft of his size and speed. The interceptor ignored the ghost image.

Teleman's jamming systems were running full power and to enemy radar screens he should be nothing more than a blank area, some twelve hundred miles across, far too large an area for their more limited equipment to handle. But the intruder clung like a leech. To test, he altered course slightly. The other followed suit. Obviously they had some type of sophisticated visual tracking system and that meant two men at least in the plane, one to fly, the other to track him. That explained somewhat, their limited staying time.

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Ten minutes later, a third intruder picked him up and the second peeled off. As soon as Teleman spotted the third blip on the screen, he boosted quickly to two hundred seventy-five thousand feet, leaving them both. They disappeared from his screens and he immediately nosed down in a flat dive, swinging out farther south as he did so. He cut his speed back to Mach 1.5 and swung out farther south after some twenty minutes on a course that paralleled his original line of flight. He quickly released a second decoy —a different type of ghost craft that approximated his general size and shape on radar and—he hoped —visually. He watched as the Soviet interceptor swung away and came up on the decoy.

Teleman fell off slowly deeper into Turkmen U.S.S.R. territory, always paralleling his original line of flight, but keeping the Russian planes on the edges of his radar screen. He increased his altitude to a point where input from a meteorological satellite, hopefully unknown to the Soviets, had been showing him a band of high ice crystals for the past half hour. The ice cloud would further help screen him from detection. He turned due north again where the Amu Darya skirted the Uzbeck-Turkmen border.

The one-sided chase continued northeastward until the marshes east of the Sea of Aral passed beneath. Teleman spotted a flight rising ahead to meet the lone hunter on an interception course. They would spread out, he knew, and search the sky until they located him and then missiles, or rapid cannon fire, would bring him down —unless the decoy did its job.

Teleman, grinning, slid off northwest until the interceptors disappeared from the long-range radar screens. As he did so, he noticed the hunter who had lost him slide off and drop quickly down toward the air base he knew to be located at Novokazalinsk at the mouth of the Syr Darya on the Sea of Aral. Probably out of fuel he chuckled.

He turned his attention back to the radar screen, nothing in sight, and so he climbed higher into the ice layer. He took up station well behind the searching aircraft and reduced his speed until they drew well ahead. Shortly, six more fighters came climbing up to meet the hunters and they in turn fell off and slid back to their base. At these speeds and altitudes, they seemed severely limited. The question was, did they have enough planes to track him to the Arctic when they found out they had been hoaxed. And, in turn, would they have the means of detecting him again without knowing his approximate location. They had probably been waiting for him, knowing that the United States would investigate the fighting. But could they pick him up again? A very good question.

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After this little bit of unscheduled horseplay, his fuel load was going to be mighty close to get him to rendezvous. He would have to reduce his speed and yet he still had to get there on time. He was certain that Larkin could be depended on to maintain station until he arrived, providing the storm did not prove too much for the ship. He had not received any weather reports on conditions between Greenland and Novaya Zemlya since he had started his run south from the Arctic. To avoid detection, all but two monitoring channels were shut down automatically during the mission portion of the flight. The Soviets were known to monitor the SAMOS satellites transmitting to the ground stations in an effort to break the codes used. He could, therefore, only guess at the weather conditions and he guessed that they would be extremely bad.

Teleman hunched forward and ran a course through the computer. He was now some eight hundred miles west-northwest of the Aral Sea, crossing the Kazakhstan border, north of Uraslk. Due west would take him over Czechoslovakia or Poland where it would be a toss-up whether the Russians would follow. The former satellite countries were very touchy any more about the sovereignty of their air space. Quickly, Teleman computed a new course that would carry him west to Poland and across the North Sea to skirt Sweden on the Gulf of Bothnia, and Finland, and then up and across Norway into the Arctic Ocean. He did not like the results. Holding his speed to Mach 1.5, it would take him another seven hours and bring him to rendezvous nearly three hours late and with empty tanks.

He decided to let the interceptors leap-frog themselves to Murmansk if they wished. Soon they would catch the decoy and they would be hunting for him again—and probably along his original flight path. Do the unexpected, they had taught him in training—and so he would. He pulled around, heading due west for Poland. At a safe distance he would radio the *JFK* to have a tanker standing by, if Larkin had not already thought of it by then.

An hour and a half later he was crossing the Don, and a few minutes later was deep into the Ukraine.

Larkin was on the bridge when Folsom stumbled through the hatchway, thrown from side to side by the violent motion of the ship in the heavy seas. Larkin nodded without taking his eyes from the scene through the bridge revolving screen. The seas were heavier than he had ever seen before and he had to fight a mild claustrophobic feeling as the mountainous waves towered around them. The winds were so strong that the waves were not cresting but were blown flat, re-

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sulting in long, rumbling swells towering sixty to one hundred feet high. The ship was on its into-the-wind leg and the water was blowing straight back across the bow and against the bridge in an almost steady stream. The aerometer stood at a steady one hundred ten knots and worse was expected.

Folsom glanced at the clock. "One hour late already," he said, more of a statement than a question.

"Hm-m-m. I'm beginning to worry now. Those boys work on clockwork, they have just so much fuel and a very small reserve."

"So I thought." He poured coffee for Larkin, the helmsman and himself. The helmsman, sitting at his hooded console with his eyes glued to his screens and instruments, waved his thanks with a free hand. Folsom worked his way over to the captain, balancing the cups against the violent pitch and roll of the cruiser.

Both turned to the radar screens mounted on the aft bulkheads, watching for the first blip of light.

"Captain!"

Larkin turned as the radio operator stuck his head in, waving a flimsy.

"Looks bad, sir."

Larkin took the form and read it through without a comment, then passed it to Folsom.

"Ye gods, here it comes. Gale winds of one hundred twenty-five knots can be expected within the next three hours, decreasing to ninety to one hundred ten knots for the next twelve hours."

"Captain, here's another."

Larkin read it through twice and turned away, his face creased into a frown. Folsom read the second and turned to Larkin who stood peering out into the driving night. He moved to the captain's side and hooked a leg around a stanchion and grasped the railing to maintain his balance. The bridge crew had long since fastened seat belts and lowered protective padding as the motion of the ship roughened.

Larkin, without a word went to his console. Folsom followed. Only then did Larkin speak.

"Pete, I'm getting worried. Ordinarily I wouldn't. This boat was built to take the roughest seas imaginable. But this time, I don't know."

Folsom watched the other man, saying nothing. When Larkin worried, it was for good cause. When he admitted it, it was time to start being scared.

"That blasted plane is late, really late. I calculated his fuel and he could arrive as late as two hours longer, but if he does, his tanks will be empty."

Folsom kept silent. He recognized that Larkin was using him as a sounding board to think through his problem. At the same time, he fought to maintain his mental balance against the raging of the storm. He had seen storms at sea

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many times before, but never one to equal this in sheer ferocity—this was a killer storm. It seemed impossible that anything manmade could withstand its onslaught.

Larkin reached across the desk for the intercom switch. "Bill, get me our BuOps in Virginia and pipe it up here, please."

"We should have a tanker waiting and we still have time to get one here—I hope."

"Ready, Captain."

"Larkin commanding Cruiser, *John F. Kennedy* here."

"Clear, go ahead." The scrambled UHF crackled and spat over the loud-speaker.

"Target overdue, one hour. Max. Time to go—two hours. Have refueler standing over—emergency."

"Can try. Weather extremely bad. Gander is out . . . try from Westover."

"Good. Will maintain station as long as possible. Out."

Larkin leaned forward and flipped the switch, then sat back slowly. "Well, now to see what happens. You read the orders?"

"Yes. *'Imperative maintain station.'* Rather final, wouldn't you say." Folsom tried to keep his voice steady.

"Final is right. I'm going to bring her around as soon as possible and run before the storm. We'll hold to ten knots and even with these seas and winds we shouldn't gain more than some thirty miles or so in the next two hours."

Folsom began figuring on a scratch pad as Larkin talked.

"I'm still wondering what's happened to our friend," he continued. "Maybe our pseudo-allies rigged a surprise party for him."

He turned to Folsom, "Get me an exact position fix, as close as you can. We'll have to home that tanker in. And, while you're at it, check on conditions aloft. They'll refuel at twenty thousand feet minimum."

Larkin climbed into his foul-weather gear and jammed a helmet and throat "mike" onto his head. He tested it quickly, gave the helmsman some last minute instructions and left through the emergency hatch. Once outside, still in the lee of the bridge, he checked the "mike" again, then slipped his faceplate down and buckled the safety straps to the railing. As he moved out of the lee side of the narrow deck, he grunted in surprise as the wind cut through the nylon and layers of foam padding as if they did not exist. Immediately, his fingers and feet were stiff and numb. The temperature was close to 20° below and with the full force of the one hundred ten knot wind added, the two combined gave a chill index of nearly 110° below zero. The deck was coated deeply with ice. Unprotected, he could not last more than a minute.

The wind pulled and plucked, sweeping his feet from beneath him

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and Larkin prayed the safety straps would hold. As he came around the curve of the bridge, the full force of the wind smashed into him and he was forced to crawl, using his hands to pull himself from stanchion to stanchion. Once the straps fouled and the wind pulled him through the railing, then they cleared suddenly and the wind slammed him back, cracking his leg violently against the bridge plating. Larkin pulled himself on until he was as close to the center of the bridge as he could get. The lights of the bridge through the ice- and water-coated glassite glimmered fitfully on the icy deck around him.

Larkin pulled himself to the railing and wedged his body between two close-set stanchions. Standing on his knees, he tried to peer ahead into the deep twilight gloom of the Arctic storm as water and ice smashed back at him from the bow. He found he could keep his faceplate clear with his glove, but water and sky were so close to the same shades of greenish-gray that it was almost impossible to tell which was which.

He asked for the searchlights and two powerful beams of light sprang out, swirling around to point out across the bow before disappearing into the twilight gray. Highlights of green and white foam were snatched from the waves and flung back at him by the wind.

Larkin crouched waiting, his arms wrapped around the railing. The water streamed back, soaking him thoroughly in spite of the waterproof clothing. The wind drove it into his trouser legs between the sealed boot tops and cuffs, down his neck and beneath the helmet, disregarding the faceplate as if it did not exist. He waited. A towering roller built in front of the ship. The bow went up, lifting toward the crest at an impossible angle. Larkin was flung back as the ship crested the wave.

"Now, hard to port, all engines full, emergency power," he screamed. In spite of the violence of the wind on the crest, the ship shuddered along its stem as the nuclear engines jumped to full emergency. The cruiser slid down toward the trough, momentarily out of the force of the wind and slued to port, its stern snapping around. As it reached the trough, she was broadside to the next mountainous wave. The ship heeled, farther and farther until Larkin almost gave up hope. A torrent of water washed him under, burying him completely. Then the cruiser was free and its bow surged around to point in the opposite direction. The following wave rolled under and lifted her high into the wind. The ship skidded down and into another trough, her bow smashing deeply into the water. For a heartsickening moment, Larkin thought she would never surface, but again the bow knifed up, shedding water in torrents like a scrappy terrier. She

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shook along her length. Larkin ordered the engines back to one third.

He hung exhausted and freezing as the ship straightened and lifted more easily into the next wave, now chasing water to the crest. Her motion eased and the water breaking over the bow was no longer a steady stream but a fitful gush as the bow came down. Larkin felt two hands go under his armpits and he was lifted to his feet. The forward deck of the bridge was now in the lee of the wind and the storm pounded in from directly astern.

Half supported, he stumbled across the deck and into the heat and glare of the bridge. After the intense cold outside, the 72° temperature of the interior was almost intolerable.

He slumped into his seat and Folsom pulled his boots and helmet off. Larkin gulped the steaming coffee that was thrust into his hands as fast as the hot liquid would allow. He stood shakily and tapped the helmsman on the shoulder before going below for dry clothes and a Benzedrine. It was going to be a long night.

III

Teleman was half relaxed, letting the liquid pulsing of the aircraft flow through his body. One section of his mind was fully aware of the systems surrounding him. The other part was lazily scanning the instruments and the ground slipping beneath. He was still at one hundred thousand feet and approaching the northern coast of the Gulf of Bothnia. He could make out the coastline of Sweden across the slate-gray body of water freckled with patches of clouds glowing red in the twilight. Rendezvous was still eight hundred miles and a little less than an hour away. His main tanks were nudging empty and he would soon have to switch to the emergency reserves. He was nearly two hours late now and was wondering how the *Kennedy* was doing when a blip appeared on the forward edge of his scope coming at him from the direction of Finland. He was still maintaining his invisibility to radar and infrared.

He watched it grow swiftly, closing on him at near his own speed. At first he thought it might be one of the Anglo-French *Concorde* flight tests, but the blip pattern was wrong and the approaching craft too small.

Teleman banked and climbed to one hundred twenty-five thousand feet. The other maintained his course then suddenly doubled speed and rocketed upwards.

Teleman slammed the nose down and blasted the turboramjets to full. He shot behind and beneath the other craft and straightened out, running for the Arctic. He was too far away to see any national markings, if there were any to begin with, but he was as sure as death and taxes were real that the

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other was a Soviet fighter-interceptor.

On his scope he watched the other perform a tight, looping maneuver that should have killed the pilot and torn the wings off. Teleman realized too late that he had been wrong. The Soviets were willing to risk violating another country's airspace to bring him down. There wasn't much chance of being spotted, and, if so, the Russians could either ignore the stiff note of protest that would be forthcoming or pass it off with an apology and an explanation that their pilot had merely strayed while on a test flight. His antics could be described as part of the test flight of a new airplane. Teleman had forgotten that he would be invisible to ground radar.

The Soviet pilot was rapidly overhauling him from the rear. Teleman had just enough fuel to reach the rendezvous point and loiter for perhaps ten minutes waiting for the tanker.

Teleman decided fast. He put the plane into a shallow climb and rocketed to one hundred seventy-five thousand feet at Mach 5.7. His pursuer dwindled for a moment and then came on again. Teleman watched his fuel as well as the radarscope. He cut the fuel fine, not daring to go any higher, and then had to drop back. He now had barely enough to reach the ship.

The Soviet plane caught up fast, throttling down as he did so, Teleman sheered violently but the Russian flier anticipated and followed him. Teleman had no real combat training and the other obviously did. They were deep into Norwegian territory by now and the Russian had cut the distance to less than a mile. Teleman twisted and turned, trying to lose the fighter, but the other kept up with laughable ease.

The Russian was now locked onto his tail. Teleman suddenly dropped his speed, cutting his engines to idle and dropped his landing flaps. They were almost useless in the thin air, but they slowed him enough to bring him up short relative to the Russian. The other, surprised by this desperate maneuver, overshot his target, but manged to squeeze off a quick, deadly burst of rapid cannon fire that chewed into Teleman's tail structure.

Teleman yawed off wildly, sliding down off his starboard wing. He fought to regain control, running his wings forward to gain as much lift as possible. At sixty thousand feet he recovered and straightened out. The response was sluggish and he was now at subsonic speed.

On his scope, the Russian pulled into a bank and shot down on him. As he neared, his guns opened up. Teleman could see the tracers lining towards him. At least one cannon shell clipped into his wing, rocking the plane violently. The Russian pulled out below and came

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streaking up for his belly. Teleman nursed every last bit of speed he could, not daring to try another evasive maneuver for fear of losing the plane completely.

As the Russian came within cannon range, he suddenly faltered, arced up slightly, and fell off, arrowing down until lost in the clouds below.

Teleman shuddered, suddenly ill. The Russian must have been on a suicide mission, gambling his fuel against knocking Teleman out of the sky—the Russian lost and he had won—or so he hoped.

Teleman wrenched his mind back to his airplane. In spite of all he could do, he was gradually losing altitude. He was down to forty-five thousand feet with still some seven hundred miles to go. He decided to risk a radio message to the *JFK*. The fringes of the storm-covered Norwegian coast appeared ahead on his radar screen.

Teleman cut his radar shield off and snapped the transmitter on and spoke quickly. "Target 1, Target 1, acknowledge."

"This is Target 1, go ahead."

Larkin's voice broke in, "Status, quickly."

"Bandit jumped over . . . Sweden. Tail . . . surface shot up . . . losing altitude, fuel . . . about gone . . . stand by for transmission."

"No, wait. Can't you get closer?"

"I doubt . . . it. Standby." Teleman turned the recorders to transmit. Twenty seconds later Larkin acknowledged the receipt. Teleman could hear him ordering a direct line to the Pentagon.

"We have a tanker on its way. Can you make it?"

Teleman leaned back, exhausted. Now that the data was delivered, his job was done. The strain of the mission, the lack of sleep and the overload of drugs in his system caused a stultifying lethargy to settle over him. His portion of the task was finished. It had been seventy-two hours since he had had more than six hours of drug-induced sleep. The plane began to fall off and he brought it back with difficulty. The tail section was beginning to vibrate heavily in the thickening air, threatening to come loose somewhere aft of the cockpit at any moment. The engine suddenly coughed once and resumed its dull, steady murmur. The emergency tank fuel needle was pushing the empty mark.

Teleman brought himself upright with difficulty. "No, fuel too low . . . to even . . . reach you. Approximately . . . twenty minutes flight left . . . air speed five-fifty, losing . . . altitude fast . . . make it . . . down on Norwegian . . . coastline . . . destroy plane."

"You can't," Larkin almost shouted. "Try and make it." Then he realized the futility of what he had been going to say. At five hundred and fifty knots that meant al-

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most an hour more to go to the cruiser and with twenty minutes of fuel left . . . idiotic, he thought savagely.

Teleman's voice came again, "I'll come in low over the coast, heading out to sea and eject." His voice was becoming steady as the drugs were flushed from his system. "The timer should allow the plane to go at least another twenty miles on automatic out to sea and then explode. The storm will take care of the rest. The Russians will never find enough to do anything with." Teleman's voice was completely normal now. He finished neutralizing the drugs and prepared to eject.

The coast passed beneath him and he swung the plane back and around in a circle until he was passing over the coast again, headed inland. He watched the radarscope trying to pick a spot as near to shore as possible, yet smooth enough to make a landing in the ejection capsule. He found his spot and dropped quickly through the clouds, hoping that the plane would withstand the severe buffeting. As he entered the storm region, the plane was slammed from side to side, bucking violently in the winds.

"Target 1 here, we are getting a position fix on you and will track you down. I'll bring the ship in and pick you up as soon as the storm subsides enough to get a small boat or the helicopter in."

"The hell you will," Teleman exploded. "Get those tapes back."

"Sorry, I've been directed to pick you up. They want to know about the bandits, and fast. All overflights have been suspended until they can talk to you."

Teleman glanced at the storm-thrashed forest and tundra below. He laughed bitterly. "If I get out of this, it *will* be a miracle. The winds are fifty knots here on the fringe of the storm and you still have three hundred miles to go."

Ahead, on the indistinct horizon, a line of cliffs appeared. Teleman armed his ejection capsule and set the timer on the destruct bomb. The plane was down to twenty thousand and the cliffs were coming up fast.

"So long," he shouted and hit the switch.

The capsule closed and Teleman was slammed upward and tumbled end-for-end as the high winds caught him. Through the canopy he could see the lightened plane, huge and sleek in the dead light, bound up, corkscrew and recover as the autopilot caught, and disappeared out over the sea. He didn't see the brilliant flash that destroyed the plane and the wind and the waves that churned the wreckage that fell into the Arctic Ocean over a five-mile wide area some fifteen miles away. Teleman was busy hoping that the altimeter would fire the main chute in time to land him in the lee of the cliffs.

His back was almost broken in the wrenching jolt as the chute

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opened and was caught by the winds at one thousand feet. He was shaken from side to side like a mouse in the teeth of an angry cat. Amazingly, the capsule landed without smashing itself to splinters. Teleman half lay in the acceleration couch, too tired to even look around. The last conscious act that he remembered was setting his watch alarm for six hours of sleep. The vibration of the sea pounding on the far side of the cliffs a mile away and the roar of the wind in the trees above him knocked him out as effectively as a blackjack.

The storm crested shortly after Larkin turned the ship to run before the heavy seas. Winds of gale force still battered the ice-shrouded, ghostly shape as it knifed toward the Norwegian coast at forty-five knots.

As soon as Teleman bailed out, the radar operator did his best to track both Teleman and the plane. They knew his landing place down to a mile.

Larkin called Folsom to his console.

"Those orders say bring him back at any cost."

"Yes, sir, I know. That means we go in and get him. What about the data?" He indicated the silent tape decks with their full reels.

"I'm sending those immediately —direct through scramble and code. It may be that the whole ball game is over now. The Soviets know that Teleman picked up what he was after. What they don't know is whether he got the data to its destination. I'm betting they will go on the assumption that he did. In other words, we have to get to him before they do."

"So we go get him," Folsom stated.

"That's right."

Larkin chafed at the delay, pacing the bridge from radar to meteorological to helm, making sorties onto the deck to judge the weather. Larkin would not admit it to anyone but he trusted his weather sense more than all the meteorological data in the world. The gale was subsiding as swiftly as it had begun but the aftermath would still be plenty bad. The high seas would continue to run for days, even after the winds had dropped to nothing. The seas were still too rough to shift to the hydroplane.

The *N.S. John F. Kennedy* was a completely new breed of ship—a nuclear-powered battle-cruiser of sixteen thousand five hundred tons displacement. In a sense, she was a revival of the British concept of the battle-cruiser as a ship carrying ultra-powerful weapons, and having extremely high speed, the class to which the old Royal Navy battle-cruiser *HMS Hood* had belonged. The *Hood* had had the armament of a battleship, the speed of a fast cruiser—and almost no armor.

In the days of the heavy-armored

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battleship, and the heavy Navy guns, she had proven a disastrous mistake as a class. The *Bismarck's* heavy shells annihilated her with a single salvo.

But that was thirty years ago; in a nuclear-armed world, there is no armor. With the realization of that simple fact, the battleship ceased to have meaning.

The *JFK* had armament that would have made the old *Hood*'s equivalent to a bee-bee gun on a rubber life raft. *JFK*'s power plants were what was called a *conag* system—an acronym for *C*ombined *N*uclear *A*nd *G*as turbine. Her base power plan was a highly advanced direct cycle, liquid lithium reactor, capable of delivering forty-five knots of cruise power under the roughest conditions of wind and wave. In addition, she was fitted with a boost power-plant system composed of four marinized advanced gas turbines capable of nearly forty-five thousand shp apiece. These engines burned any organic fuel from Bunker C to naphtha, and turned out eighty-five knots or better emergency speed in combination with the base power plant.

There is a point in marine hull construction that is akin to the sound barrier for aircraft. That point, ranging from fifty to sixty knots, creates such shock waves along a conventionally designed hull that the power required rises astronomically in proportion to speed gained. It is virtually impossible to push a conventional hull of such displacement past fifty knots.

To circumvent this, the designers of the *NS JFK*, gave her a very different hull. The hull was stepped aft of midpoint for cruising between fifty and sixty knots. High pressure ram pumps forced air into the steps, creating air bubbles that merged at high speeds, reducing the friction coefficient by some forty per cent. Above sixty-five knots, a large bow hydroplane and two smaller modified hydrofoils aft, were extended, and the ship roared out of and above the waves at nearly ninety knots. She was fitted primarily for long-range and roving ASW work at the moment, but was more than capable of replacing an entire fleet of conventional ships. She carried enough armament in Posideon, anti-missile, surface-to-air, and surface-to-underwater missiles to take out an entire fleet. Her bows were crammed with the latest in detection and anti-detection gear.

She was in short, a self contained armada—the first of a new class of capital ships—the President class battle cruiser—a complete fleet in one ship. Because of her speed and armament, she was invincible to surface craft and submarines. Her anti-detection gear hid her from electronic detection by aircraft and her missiles protected her in the event of a visual sighting.

With the abating of the heavy

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winds, the temperatures rose above freezing at sea and the snow turned to sleet. It poured down in icy buckets. The rain and sleet, coupled with the rising temperatures and heavy seas, peeled and ripped the ice from the *JFK* in great chunks. The deck heaters were able to clear away the worst and heaviest accumulations of ice and the ship became more responsive to the helm as it rode higher. The cruiser beat its way southeast, now a gray shape slipping through the rain and running seas, rolling through forty degrees in the mountainous waves, seeking the shorter waters of the continental shelf.

Teleman opened his eyes. A gray, washed-out light stared at him. His mind was fuzzy and he experienced the mild panic of disorientation. He could not remember for a moment where he was at or what the shrill buzzing that filled his ears meant. Groggily, he reached up a hand to rub his eyes and saw the watch. Remembering, he shut it off and stretched stiffly as far as the narrow confines of the ejection capsule would allow. Teleman unbuckled the harness and pushed the canopy off. The frigid wind and cold shocked the breath from his lungs and he coughed and choked.

He managed to crawl out and pull the emergency kit after him. First, he crouched behind the battered capsule and checked the kit. Pistol, notebook, Very pistol, field glasses, first-aid kit, rations, compass, extra socks and gloves, short-range radio, plastic Arctic boots. These he slipped on over his flight boots. A tube of Benzedrine capsules were included, but he ignored them for the moment. He might need them later, and his metabolism was way down from the flight, drugs, and lack of sleep. He broke a ration and managed to choke down the greater part of it. He shoved the remains and wrapper into the capsule, armed the thermite bomb inside the hatch and ran awkwardly to the line of trees.

The thermite bomb exploded and the metal and plastic capsule fused into a shapeless, hissing mass in the steady downpour. Teleman checked his watch; still at least two hours before the ship could arrive, if, in fact, it could arrive at all. He figured he was little more than a mile from the sea, but even so, he could hear its dull pounding on the granite cliffs. Teleman could not remember whether or not there had been a beach of any kind and the wind was way too strong for the light helicopter the cruiser carried. He managed to take a compass reading and bending into the rain and wind, Teleman started slogging towards the coast. After walking for five minutes, he knew it was going to take the entire two hours.

The forest thickened with dense stands of soaking wet, lashing pine branches. The ground became soggy, almost muskeg. After nearly an

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hour, he had covered less than half a mile. Shortly, the ground began to rise and became rocky and solid underfoot. The pines thinned, giving way to scattered brush and glacial boulders. The going eased, but on the verge of exhaustion as he was, Teleman did not notice it.

The sleet turned to snow, solid flakes of wetness whipped by the wind that got around hood and scarf, melted and trickled down his back and chest. He stopped to rest behind a small stand of scrub pine and a lone glacial boulder. He sat, legs stretched out and his back against a tree trunk that rolled and sawed in the wind.

He had never seen such God-forsaken country. The snow swept through the trees, lashing in the steady keen of the wind. The whole scene reminded him of Dantes description of the ninth level of hell; so unreal and remote from Earth did it seem. The predominate color was gray—gray sky, gray snow, gray rocks, gray trees, and he was the doomed soul, doomed to wander in this gray hell forever.

He shivered at his morbid thoughts. He could feel the warmth of his body quickly dissipating. He had to get up and keep moving or freeze to death. Teleman pushed aside the soft tendrils of sleep curling around his eyes and struggled to his feet. He faced the wind and snow and went on.

Now the snow came thicker and it blotted everything. He was moving on a treadmill in the middle of a white nothingness. He tripped and fell heavily. The trees were gone and through the driving snow he could make out the hard outlines of a rocky cliff. Crawling painfully, he worked his way to the edge and stared down at the pounding seas—the waves, tall and green —smashing into the jagged baseline of the cliffs, less than thirty feet away. There was no beach. The snow was so heavy he could see no more than four or five hundred feet out to sea. The wind, slicing in from the Arctic with the keenness of a razor, forced him back from the cliff edge.

Teleman huddled into the lee rocks and dug out the radio. The lightweight unit was almost too much for him. He had to prop it against the rock to extend its aerial.

"Target 1, do you read me, Target 1, do you read me?"

The dials were softly illuminated so the set appeared to be working. His watch showed at least twenty minutes past the time the ship should have arrived. The question was, could he hold out long enough to raise them. Of a sudden, he doubted it very much.

He had lost all feeling in his feet and hands and had to use his five fingers to flip the transmit switch. The radio's range was close to one hundred miles and the ship should be standing no more than twenty miles off the coast at the most.

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He tried again and again. For more than fifteen minutes, fighting to stay awake in the cold, white desert, Teleman lay huddled behind the meager cover of the rock, too exhausted to speak for a few moments. He thought he would rest and try again. The answer came, crackling and spitting over the receiver. He was almost asleep. He drew his conscious mind back from the long brink of warm sleep and summoned up the will and strength to answer from some dark recess of his body he never knew existed.

"Target 1," he finally managed to croak. He tried to say more but could not. The radio operator's voice, almost lost in the storm came over the tiny speaker again.

"Leave your transmitter on, we're getting a fix. We are standing off the coast about a mile from where you are. Can you fire a flare to pinpoint your location?"

Teleman muttered something and fumbled in his kit for the Very pistol. His hands refused to work and in an agony of frustration, he overturned the canvas bag and scattered the contents. Crawling painfully forward, he got to his knees and scrabbled for the gun. He sat against the rock and using two hands, wedged the grip between his knees. He forced two fingers through the trigger guard until the pistol went off. The shell arced up and lost itself in the falling snow. Five seconds later, a brilliant flare exploded and drifted down, shaken and thrown from side to side in the wind. It landed in the snow not fifty yards from Teleman and sputtered and hissed as its magnesium burned out.

Teleman heard Larkin's voice calling over the faraway transmitter that the flare had been seen. He nodded his head and slipped down into warmth.

IV

Larkin moved the cruiser in as close as he dared and held, using the powerful engines. The surf and breakers half a mile on were mountainous, almost certain suicide to attempt in a small boat. The winds had dropped to the mid-sixties this close in to land, still much too high for the helicopter.

Teleman's lone flare was at least half a mile up the coast but the radar indicated sheer rock walls sloping steeply into the sea. The point of shore opposite was a shallow, indentation in the cliffs and held a small rocky inlet and gravel beach—the only beach large enough to take even a small boat for miles in either direction. If he searched and found a more sheltered spot farther down the coast, the search party would never find Teleman in the blizzard. Even from here it would be touch and go. He was certain that Teleman was so weakened he would be dead in a very short time unless he got help to him.

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"Pete, what do you think? Can you get a boat in?"

Folsom had been studying the coast and the small strip of beach through powerful glasses.

"I don't know, Captain. Getting in would be the trick."

Larkin took the glasses, "If you got in safely, you could hole up until the storm eases, or at least the wind and seas stop running so heavily. The important thing is getting to him and fast."

The radio operator looked up from his console. "Still nothing, sir."

Larkin nodded and turned to Folsom. "Well, Pete, what do you think?" he repeated.

"I guess I can only give it a try," he said with a grin that he certainly didn't feel.

Five minutes later, they swung a powered launch over the side and timing the waves, managed to get into the water without being smashed against the towering hull.

As they neared the breakers, Folsom idled down and as a wave swept them forward, gunned the engine powerfully and tried to ride the surf in. He almost succeeded. The roller lifted the bow and kicked the stern around, sweeping them into the trough. The boat was tossed high by the following wave and it smashed down hard on the rocky beach. The waves continued to kick the side of the boat.

Folsom climbed over the side, shaken but unhurt. The others, two volunteers from the crew, joined him and helped drag the boat higher onto the beach. The propeller shaft and rudder were hopelessly mangled. The hull was ripped along its stem and useless. They wasted no time. Folsom made a quick report and they moved out along the coast.

The storm passed on to the northeast, carrying its high winds with it. As the wind died, the snow fell thicker and the temperatures dropped rapidly. Between the cold and the deepening snow, it took the three men almost half an hour to reach Teleman. They stumbled across him almost by accident. He was nearly buried by the snow and unconscious.

Folsom led the way to the tree line and they pushed their way in to the deep pines before they stopped. The wind was now a fitful breeze that eddied the falling snow into swirls of white, but they could still hear the surf pounding, nearly half a mile away. The two sailors rigged the tent quickly and Folsom stripped Teleman's sodden flying suit off and got him zipped into a chemically heated sleeping bag. The tent warmed quickly from the Coleman stove and Folsom rigged the radio. He had no trouble raising the ship.

The report that came was not encouraging. The long, rough seas that always follow Arctic storms were making it harder and harder

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for the cruiser to maintain its position.

"I am afraid that we're going to have to stand farther out to sea until it lets up. The winds are still running too high out here for the helicopter and the surf is higher now than when you went in. Another hour and you wouldn't have made it for anything."

"I was afraid of that, Captain."

Larkin was silent a moment, listening to the keening of the wind through the pine tops that carried over the radio.

"Things are really beginning to complicate," Folsom said finally.

"How do you mean?"

"Well, it occurred to me on the way up here that if the Ruskies were so anxious to knock this guy down, that they would jump him over someone else's territory, what's to prevent them from trotting overland less than seventy-five miles into Norwegian territory. They could drop troops or send in a boat around the Norwegian border guard. It's a cinch their Navy is either at sea riding out the storm or sitting in some nice snug harbor on the North Sea."

"I see what you mean."

"On top of that, what about the bow? You must be taking a terrific pounding from the sea that's running."

"You can say that again. That's one of the reasons I want to put out to sea. How's Teleman by the way? It's about time I asked."

"Exhaustion and cold, but I don't think there's anything serious. We've got him in a sleeping bag inside a warm tent. I think a few hours solid sleep ought to do it."

"That's good, one further complication avoided."

"Well, other than that, everything seems to be all right. Funny, the wind is dropping quite rapidly here. Must be the cliffs blocking it. Out there you would still be getting the full force of the aftermath. By the way, how's the snow? It's becoming a regular Michigan blizzard here."

"Pretty heavy out here, visibility almost to zero. It's half rain, half snow, but heavy."

"Hm-m-m, looks like we're stuck here a while. I'll set hourly radio watches for routine checks."

"Fine, we'll keep you informed, over and out."

Folsom slung the radio over his shoulder and looked around. The snow had softened to a gently falling mass as the wind died. It still moaned through the treetops, eddying the soft powdery flakes into whirling gusts. He wanted to take a good look at the area, but, with the heavy snow and the close-pressed trees, he did not. It would be too easy to become thoroughly confused and lost. He returned to the tent.

The snow continued to fall throughout the long night. Folsom organized two-hour watches on the radio and then tried to get some

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sleep—much needed sleep—in the crowded tent. The close nylon mesh of the tent material did not allow much in the way of air circulation. The outside temperature dropped to 15° F below and the wind died to nothing. Folsom groaned and rolled over, trying to ignore the closeness of the air, thinking longingly, for the first time, of the mind-deadening desk job in the Navy Department that he had left for the *JFK*.

The buzzer over Larkin's bunk sounded, snapping him awake. He sat up suddenly and cracked his head on the shelf and cursing, flipped the intercom switch.

"What the hell—"

"Sorry to disturb you, sir, but sonar shows a blip, unidentified sub approaching from the northeast."

"Be right up," he snapped.

Three minutes later he was peering at the screen, bracing against the console as the ship bucked into the heavy seas.

"They seem to be heading for the coast, sir, about eight miles from where Lieutenant Folsom landed."

"Another complication," he muttered half to himself.

"Pardon, sir?"

"Nothing, just talking to myself. What do you make of it?"

"From the sonar, she's hugging the coast and heading in about twelve knots—less than a mile out now. A nuclear fleet sub—one of their new fast ones from her pattern," he said, indicating the screen, "from the pens at Murmansk." The tight beam, narrow sweep, sonar continued its oscillating search.

"Only one place they could have come from and only one person they are after—better stand to General Quarters."

The boatswain hit the battle alarm and the horns sounded through the ship. Larkin brought her around, bow on to the sub. So far it appeared as if she had not seen the *JFK*. Larkin stood in as close as he dared until only fifty miles separated the two ships. After twenty more minutes, the sub appeared to heave to, surfacing until her decks were awash.

"She must be rolling 70°. I pity her crew." Larkin turned away from the screen to examine the charts of the coast. At the point where the submarine lay, there was a small cove, but without any shelter since it faced northeast into the teeth of the wind.

"They *might* get a boat into that cove, but I sure wouldn't want to be in it," Larkin observed.

On the screen, a small shape detached itself from the sub and headed towards shore. As soon as the boat was away, the sub submerged.

"Keep a sharp sonar watch. All engines to stop. Switch to silent running," Larkin ordered.

The quiet murmuring died.

"They may have picked us up already over the noise of their en-

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gines. Let's see what she does." Larkin moved across to the sonar console.

"Just at periscope depth, sir. They either don't seem to be aware of us, or they don't care."

"I'd say they don't know we are here. We're both in international waters and we both know the stakes. They would have been ready for a fight if they spotted us. They probably think their pilot damaged Teleman enough to bring him down and now they want to pick him up before either the Norwegians, who may have spotted Teleman coming down on their radar, or we manage to get in. We'd better warn Lieutenant Folsom while they are busy in the boat."

Teleman came awake slowly to the sound of Folsom's voice, still drugged with exhaustion. The tent was dark except for a dimmed Coleman lantern near the front of the tent. He became aware that he was lying stripped to the skin in a heated sleeping bag. A sailor was stretched out next to him, sound asleep. Folsom's voice was muffled as he and another sailor crouched over the radio, their backs to him.

Teleman tried to clear the fuzziness from his mind and figure out where he was. He had no idea who the three were—friendly or what. He saw Folsom's head nod two or three times then reach out and peer through the tent flap. Immediately a gust of wind blew in, bringing swirling snow with it.

"As far as we know, there is just the one boat load so far, and they managed to make it in."

"Any idea how many?" Folsom asked.

Teleman felt a flood of relief pour through him as he thought, *At least they speak English. They must be from the cruiser.*

The tiny radio voice came again, "Twenty men in a small boat, probably a rubber raft. The MTI radar indicated at least that many."

Folsom turned to look at Teleman and saw him staring back. He grinned cheerfully and waved. Teleman continued to stare at him, too tired and fuzzy to turn his head.

Folsom signed off and crawled back to him.

"How do you feel?" he asked.

"Beat."

"Other than that?"

"Nothing, I think I could sleep for a week."

"Yeah, I'll bet you could," Folsom grinned. He nudged the sleeping sailor, who came awake instantly, gun in hand.

"I want you to meet your helpmates here," Folsom grinned. "This character with the itchy trigger finger, is assistant chief gunner—an empty title as we have no guns but a fifty caliber popper for salutes—we stole him from the Special Services just for jobs like this. His name, and this you won't believe, is Beauregard Hubert MacPherson—and accounts for his fierceness."

MacPherson grinned sheepishly

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and said "Hi." His big, warm hand all but engulfed Teleman's.

"And this other joker here is "Boatswain, first class, Julius Gadsen. He's another free loader; his specialty is driving the captain's gig."

"Hello, Friend," Gadsen chuckled, shaking hands.

"Which leaves me—Lieutenant Peter Folsom, executive officer of the *N.S. John F. Kennedy*."

Teleman looked carefully at the three faces above him. "Glad to see you guys. You don't know how glad. Remind me to stand drinks at the first opportunity."

"Good enough for me," MacPherson said.

"Well, now that the pleasantries have all been taken care of," Folsom interposed, sitting back on his heels, "gather round and listen laddies, we gonna have company."

"Company," MacPherson echoed.

"Yep, our Red friends appear to want to welcome us to the Land of the Midnight Sun. The captain just informed me that there's a sub about fifteen miles east of here and a mile off the coast sitting submerged, after dropping a load of bully boys about ten minutes ago. So we have to beat it before they get here."

"Now there is a problem," said MacPherson, peering through the back tent flap. "It looks as if the wind will be kicking up quite a breeze out to sea and the swells will be even worse. You can hear the waves on the cliffs. On top of which the snow is so thick you can't see your hand in front of your face, which rules out the helicopter. So?"

"So, we walk."

"Walk, where to?" Gadsen asked.

"There's a Norwegian outpost about twenty-five miles down the coast. A combination radar and naval station. Pretty heavily defended. Our Russki friends won't risk outright aggression to get Teleman . . . I hope. If they do, the Norwegians know how to use those radar-controlled guns they've got."

He turned to Teleman, "Do you feel like a little hike?"

Teleman groaned, "Little . . . twenty-five miles?"

"That, or a Soviet prison," Folsom said cheerfully.

"Get me some clothes," he said resignedly.

Folsom spread out a series of charts and pointed to a small indentation. "This is where they landed. In this weather it should take them almost a day to reach what's left of our boat. They probably have a darn good idea where you are at," he said, looking at Teleman, "but the captain is certain they don't know we are here. So, until they see the boat—if they see it—they won't know we are around. They'll travel as fast as they can and even faster after they see the boat. That's why I estimate one day."

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"Hey, Pete," Gadsen interrupted, "why not just radio the Norskis and ask for help, they'll chase the Russians off for us."

"I thought of that, but that sub will pick up the transmission and move in and shell the life out of us. They don't want to get caught, but even worse they don't want to lose Teleman. The ship could move in and blow them out of the water thereby creating an incident that *'could lead to war.'* Not that I'm concerned with that at this point. However, it would still take the Norwegians over a day to get here and we would still have to deal with the Russians that landed. On top of which the Norwegians would certainly not care for us starting a war on their territory—NATO allies or not. So we go to them."

"Kind of in a bind then, huh."

"Precisely, so let's git. Here's our destination. We had better move out of these trees and onto the cliffs. It might be rougher but we can follow the coastline. About here it turns into tundra." He indicated a point about six miles down the coast. "At this point it will be a toss-up whether or not the tundra is passable. If so, we go across, if not, we follow the coast."

The chart showed an irregular jut of land that bulged around the tundra for a distance of thirteen miles. The contour indicated crags and steeply shelving granite leading to a sharp drop, fifty feet to the water. Beyond, the land flattened again to beach and a narrow pine and scrub-covered belt fronting on the tundra. The Norwegian base lay beyond about four and a half miles.

"What about this town east of here, Vardö? It's only about twenty miles, less, if we cut overland," MacPherson said, pointing at the map.

"Yeah, but the problem is, the Russians landed just about five miles west of the town. The captain figures they probably came out of Murmansk originally and were at sea somwhere in the Varangerfjord during the storm and that's how they got here so fast.

"I thought of heading south to Vadsö, but there is a range of mountains about three thousand feet between us and the town. And, the only pass leads west and then south for a total distance of nearly seventy miles. According to the map, the pass is at one thousand feet anyhow. Teleman could never make it, and it's doubtful if we could in this cold. So, it's west to Tanafjord and the Naval Station."

Teleman finished dressing and pulled on a pair of insulated boots over two pair of heavy wool socks. Over a thick quilted under-jacket he donned a Dacron filled parka with a light nylon ski parka covering. Silk gloves and two pair of insulated mittens completed the standard Arctic wear.

Folsom looked him over. "How do you feel?"

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"To be truthful, still pretty weak, but I think I can make it."

Folsom reached into the big pack and pulled out an aluminum tube. "Try a couple of these. Benzedrine, they'll pick you up."

"Yeah I know, but I'll wait for a while. No sense exhausting myself too early."

Folsom nodded, "Yes, I guess you're right. Well let's move."

They broke camp quickly. Teleman was surprised at the speed and efficiency with which everything disappeared into three sixty-pound packs, slung on Himalayan racks. Each man carried an M-15 rifle with a collapsible stock, as well as canteen, knife, and flashlight. Teleman took the first-aid kit and rolled-up tent from MacPherson over his protests and the four men moved quickly through the trees to the top of the cliff. As soon as they stepped from the tree line, the full force of the wind caught them square in the face. Snow, swirled up by the wind, stung at their faces.

Folsom ordered face masks on and they bent into the rising wind, paralleling the tree line and the cliff edge. To Teleman, the next eight hours passed endlessly in a haze of pain as his tired muscles and joints protested every movement. The cold was insidious and the temperature was dropping fast. Teleman had never been so cold in his life. In spite of their exertions, the cold seemed to cut through their Arctic clothes as if they were tissue. The first touches of frost reached through the soles of his boots and socks and shortly his feet were numb. From there on, he stumbled constantly, half supported by the giant MacPherson whose strength seemed endless. Through the snow mask, Teleman could feel the skin on his face grow numb, then stretch as if it were about to pull his face apart. He rubbed his cheeks and nose with gloved hands and the pain of returning circulation was fantastic. He hated to think what would happen when his feet and hands began to thaw—if they ever did.

Folsom stopped for a brief five minutes rest every hour; but after the morning and the brief five to ten minutes of sunlight at noon passed into deepening twilight, they rested standing. No one dared sit or lie down. The cold deepened even more. Before they left the forest and entered the sparse grasslands, they began to hear the sharp cannon shots of stunted trees cracking in the intense cold.

By four that afternoon they were on the edge of the tundra. The jut of the coast pulled away to the north. MacPherson edged out into the beginning of the tundra plain running west to the horizon. He bent down and brushed the accumulated four inches of snow and deeper frozen dirt and rotting vegetation from the surface of the hard ice that never melted.

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Folsom, Gadsen, and Teleman followed him out to the spot where he was staring at the darkness in the west. Behind them, a three-quarter moon was just clearing the horizon and its pale gold light shone through the thickest part of the atmosphere, a warm tint to the ghostly, wasted landscape. The fitful wind died to next to nothing for which Teleman was profoundly grateful. At these temperatures, snow froze into solid crystals of ice, tiny particles that, whipped by the wind, worked their way between snow mask and hood and glove and cuff. Teleman felt as if his hand and face were ringed by crusts of burning ice. His gratitude was short-lived however. As the wind died, the cold deepened until Folsom guessed it was close to 30° below zero.

They struggled on, trying to get as far into the tundra as possible before stopping for the night. Teleman was moving in a daze. He had long ceased to feel the cold as such. He was in a world of his own in which the glimmering moon and crystal stars were a pale blur overhead. His body moved mechanically, one foot plodding down in front of the other. MacPherson was supporting him constantly now.

They stopped at 8:00 p.m. that evening. MacPherson and Gadsen rigged the tent hammering the metal pegs into the frozen ground. Teleman slid down and watched dully as the three men finished camp. Folsom came over and knelt beside him.

"How do you feel?"

"Yuck."

"That's what I figured." He studied Teleman's graying face as he fumbled with his own face mask. Yellowish cold blisters pocked the other's face as he was sure they did his.

Folsom pushed Teleman into the tent and ordered him into a sleeping bag fully clothed. Teleman crawled in thankfully.

Gadsen set the Coleman stove going and shortly the temperature had risen to 36°F. Gadsen thawed out ration cans over the fire and passed them around.

"If this cold gets any worse," MacPherson said, "it's going to be the roughest nine miles you ever saw."

"I know, I've been thinking about it all afternoon."

Teleman was barely awake, struggling to keep his eyes open. He had never been so tired in his life. Circulation was beginning to return to his feet and hands and the pain was almost unbearable as he feared it would be. In spite of it, he felt as if he could sleep for a week. To keep awake, he massaged the blistered skin of his face and rubbed his hands together.

"The Russians will be desperate to catch us. They will have found our camp and will know Teleman has company. What they may not

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know is whether or not we came from a plane, sub, or surface boat, or even if we are Norwegians.

"I feel sure," Folsom continued, "that they will assume that since they got ashore, someone else could, too. Whether they spotted the *JFK* or not, they will know that an American ship or plane is out there somewhere. They can add two and two as well as anybody."

He stopped and examined the three haggard faces peering at him in the dim lantern light. Fatigue, bone-breaking fatigue, was written on their faces, Teleman's especially. The walking was nothing to these men, but the intense cold, the wind and the exceedingly dry air and the tangled grass of the tundra all combined to sap strength at a magnified rate. He himself, felt as if he could close his eyes and never wake again. His legs and feet were screaming with fatigue and returning circulation. It was with difficulty that he was able to still his shaking hands.

"Whether or not," he continued, "our *friends* will travel all night, I don't know. But I do know that they will be as tired as we are." Folsom paused for a moment before releasing his bombshell. He was extremely angry with himself for not having thought of it sooner. The only excuse he could make to himself was the cold that sapped everything, requiring the most intense concentration just to put one foot in front of the other.

"I did not think of this until just a while ago. That Russian sub has no reason for waiting off the coast some twenty miles back. In fact they will probably put out to sea and keep pace with their search party." The other three continued to watch him, flickers of apprehension appearing on their faces.

"When the search party finds we left without waiting for them, they will probably inform the sub and the sub will move down the coast. It will be pretty plain to them where we are heading and there is nothing to prevent them from dropping another party to try and catch us in a vice."

The other three swore violently, more angered at themselves for not having thought of this possibility also. Teleman was wide awake now, the pain and fatigue of his screaming muscles forgotten.

"Now what do we do?" Gadsen asked.

"Well, first of all, we all need sleep, that's for certain. So we take four hours for sleep. That means we have to stand watches. Teleman is out, he needs all the sleep he can get."

He ignored Teleman's protests, and continued. "An hour and fifteen minutes each. That will give us about three hours sleep. I'll take the first, MacPherson you have the second and Gadsen you take the third." They nodded in agreement.

"What about tomorrow?" MacPherson asked.

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"I don't think it will do us much good to head inland to lose them. The sub will have dropped the second party as close to the Norwegian base as possible and work them back; try to catch us between the two. So we just make tracks as fast as possible for the base."

"How about letting the captain know?"

"No good, if we try to radio, they'll pick us up and pinpoint our location. I can't conceive of them not keeping a watch on our frequency. We'll wait until they find us and then let Larkin know. He should be able to give us some kind of covering fire if we need it."

"Oh boy, I wouldn't give any odds on our chances," Gadsen groaned.

"Don't quit yet," Folsom warned. "We still have a couple of things in our favor. One, they have to be more careful than we right now. They are in unfriendly territory. At least we can be assured of asylum in Norway."

"Number two, they don't know exactly where we are or that the *JFK* is standing off the coast—I hope they don't anyway. But I'm pretty sure that Larkin will stay hidden as much and as long as possible. Our radar must be far superior to anything they can carry. So don't count us out yet."

The four sat in silence for a few moments until Teleman sighed and said, "Well we can only wait and see what tomorrow brings, I guess."

Folsom donned his face mask again and pulled his gloves on. He slammed a new clip into his rifle and shoved extras in his pockets.

"Nighty night," he grinned and crawled outside.

The cold hit him with the force of a truck, slamming the air from his lungs. He bent double and coughed into his fur-covered mittens, trying to breathe shallowly to avoid frosting his lungs. In a few moments, the spasms passed and he stood up slowly.

The harsh moon was a quarter of the way up the sky. Its light falling on the snow covered ground gave him visibility almost to the horizon in every direction. The wind had stopped again and his breath froze instantly, wreathing his head in a clammy fog if he stopped in one spot too long. Folsom had never dreamed that it could be so cold. The stars burned in the sky in spite of the moonlight and the air was so cold and dry that he could detect no trace of ring around the moon. As if to form a backdrop for the unearthly beauty of the moon, the aurora had sprung into the northern sky, shimmering curtains of color that fluctuated and flowed in the gentle breeze of the electron stream from the sun. Any other time he would have been entranced with the shifting tapestry of color, but tonight it was both too cold and too dangerous.

He moved away from the tent slowly, stopping now and then to

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peer intently. He could see nothing in the entire waste of frozen tundra in any direction. They were now seven miles from the coast and nothing of the sea was visible or audible. About one thousand yards out he began to move in a circle with the tent in the center. It would leave tracks in the snow, but it did not matter. The Russians knew their approximate location and it was pretty certain that in a few minutes they would know their exact position.

Folsom concentrated on the east and the west, the likeliest directions that either party would approach from. After forty minutes of plodding, it became a question of whether or not he could last the remaining half hour or so. Even with the most intense concentration and violent shivering, that did more to sap strength in the Arctic than anything else, and the continual plodding around the almost mile long circle, he had to fight sleep that would steal insidiously into his mind. Sleep that promised warmth, and his body craved warmth now more than it ever had before in his life. He tried to shake it off and kept plodding.

Somewhere in his mind, almost below the conscious level, there was something wrong. His mind was too hazy, too numb with cold to pinpoint the sense of wrongness. Vaguely, Folsom knew that it was very important, but he could not muster the necessary energy to concentrate. Soon it slipped from his mind.

MacPherson caught him on a sweep to the north, half asleep and mumbling to himself. He felt the big man's hands touch his shoulders and almost automatically swung around, the butt of his carbine whistling in a vicious arc at the other's midsection. MacPherson caught the gun in a huge paw and stopped it; then gave Folsom a gentle shove towards the tent. Folsom did not remember crawling into the sleeping bag.

Teleman found himself at the end of a deep shaft. Above the velvet black sides of the hole spiraled up to an undefined blob of dark, half-light, a formless nothing. His mind refused to work, seemed mired in a haze of quicksand. He fell sharply . . .

"Come on boy, wake up."

He was awake, but the suddenness of wakening disoriented him; he looked furtively around without moving and found that he was sitting upright. Gadsen squatted next to him, staring into his face.

"You all right?"

"Yeah, yeah," Teleman mumbled. He pulled the unzipped sleeping bag half away and crawled to his knees. He brushed his hand across his forehead and found it soaking wet.

"Here." Gadsen handed him a handkerchief and he wiped his face and hands.

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"Come on, we're moving again."

Teleman pulled his face mask down over his head and crawled outside the tent. He saw MacPherson with binoculars looking toward the east. Before he could say anything, Folsom thrust a rifle and clips into his hands.

"O.K., let's go; and stay low."

Half bending, they trotted away to the west, MacPherson bringing up the rear, kept a hand on Teleman's belt, half support, half urging.

"What about the tent and supplies?" Teleman managed to gasp out between coughs.

"No good to us now. I spotted the Russians moving towards us. God knows which bunch, but I'll bet it's the first party. Save your breath and move."

The tundra sped past the four as they trotted over the hammock grass. The flaming aurora was ignored by the four men hurrying across the frozen landscape. The ground between the clumps of grass rang under their hard-soled boots. Teleman covered his mouth and nose with a gloved hand. His throat was dry and burning. The frigid air seemed to suck every last drop of moisture from his body.

After a mile of racing across the flat land, the tent was no longer visible in the bright moonlight. Teleman noticed that the moon was approaching zenith; it had been less than three hours since they had stopped. He groaned inwardly.

Teleman dropped gratefully to the frozen ground when Folsom called a halt. MacPherson straightened slowly, eyes glued to the glasses.

"Nothing, Pete. I can see the tent but they are still a good distance beyond. I can just barely make them out. They seem to be coming cautiously, wait . . ." MacPherson leaned forward slightly, striving to see, pulling the glasses to the left and then to the right.

"They seem to be spreading into a circle to approach the tent."

He turned and knelt down. "It'll take them about fifteen minutes to find out we're gone."

"O.K., let's make tracks." Folsom jumped up and started to the west again. Groaning, Gadsen followed, and Teleman, helped by MacPherson climbed shakily to his feet and moved off after them.

To prevent himself from passing out on the others, he slipped two Benzedrine capsules into his mouth. It was dangerous he knew, but even more dangerous was collapsing at the moment. The vile taste of the capsules increased his thirst as he had to chew them since his mouth and throat were too dry to swallow, but the taste was soon forgotten.

That part of the journey remained clear to Teleman, surprisingly enough. The strength-deteriorating six days in the recon plane, constantly being infused with drugs, and then the abrupt projection into the terrible Arctic cold and the long

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walk across the Norwegian coast was too much for any man to endure for long. Even the powerful MacPherson was beginning to show signs of exhaustion.

As his mind cleared, the misty edges of unconsciousness began to recede somewhat and he straightened and began to walk more steadily after the others. Teleman felt extremely light-headed as the pills took effect. He soon lost all sense of weariness now and he began to feel as if he could walk at this pace the rest of the night. He knew it would not last however, as his last bit of resistance was completely gone.

He put aside thoughts of what might happen later and concentrated on moving ahead as fast as possible while he could.

Almost an hour later, Gadsen called out, "Hit the deck. Fast!"

Folsom wriggled over to him and took the glasses from MacPherson. After a moment, he rolled to face them.

"That's what I was afraid of. There they are. They've seen us. I'll bet they've been sitting there waiting."

Teleman took the glasses. Towards the north, he could see the moonlit figures slipping towards them in a half crouch. He counted twenty in all. MacPherson took back the glasses and searched the way they had come.

Teleman was still riding the crest of the pills and he knew it. An idea had been forming in his mind and he was certain that it offered them a chance.

"Pete, do you still have those Benzedrines?"

"Yes, what do you have in mind?"

"Pass them out. Those birds made one mistake—they let us catch up level with them before moving in. Maybe they feel they can run us down easily without a fight, who knows. They are still about a mile away. We have less than five to go and we can radio the Norwegians for help."

"We don't have any choice." Folsom passed the pills out.

"O.K., up and let's go!" The four were up and running again towards the west. To the north, Teleman saw the Russians spring up and start after them.

Gadsen unslung the radio as he ran, looking very unhappy. He flicked it on and Teleman clearly heard the hollow chattering of static from the aurora. Folsom heard it too, and dropped back.

"What's the matter?" he shouted. Gadsen gestured angrily at the sky. "Those northern lights, they are jamming us out completely."

Folsom swore. That is what had been nagging at the back of his mind earlier—the fact that the aurora would ruin radio reception, particularly from their small, low power set. "Any chance of getting through at all?"

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Gadsen switched the set off and on again, trying to use the transmit switch for code sending. "Not a chance, nothing but static."

Teleman felt a sinking feeling begin in his chest. He knew that it was the effect of the pills beginning to wear off. Suddenly, he slammed into MacPherson's broad back. The giant was pointing straight ahead as he shook the rifle off his shoulder. Teleman could see gray shapes gliding toward them at a run. Now he knew why the second party had let them come even. There was a third party put ashore by the sub and they were now boxed in on three sides, with the open Norwegian tundra stretching two hundred miles south to the uninhabited forest. They could never survive out there—not even for a day—in their condition.

Larkin paced slowly back and forth on the dimly lit bridge, apparently oblivious to the scene around him. The ship was still rolling heavily in the running seas but the wind had moderated to a stiff twenty knots. It had been nearly twenty hours since he had been called to the bridge. Nine hours earlier, the submarine had moved down the coast, pausing twice to drop two more search parties, and then put out to sea again to lie waiting at periscope depth some five miles out in international waters.

Larkin was certain that the sub commander was unaware that he was being watched and he gambled heavily on this. Right now he was worried, much more worried than he allowed to show, about what was happening to Folsom and his party. He did not dare chance a radio message as it would give him away, so all he could do was to wait. The reports predicted a moderating sea that would allow him to launch the helicopter within thirty-six hours. So far the seas showed no signs of moderating and thirty-six hours would probably be far too late anyway. All he could do was to wait for Folsom's radio message for help or to report that they were at the Norwegian base. So he paced.

The whole mission was plagued with complications.

The Russians jumping Teleman really began the whole shebang. It made it imperative that Teleman not only be rescued, but delivered to Washington as fast as possible. Larkin was extremely worried about the paragraph in his supplementary orders, received only a few hours before, that stated that he was to use all means at his disposal to bring Teleman back. That meant regardless of whether the Norwegians would let him go or not. And Larkin knew that if he had to use force against the Norwegian naval base to bring Teleman out, that it meant the end of his naval career. He might have orders but Washington was never going to admit it. He did not like it, but he was ex-

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tremely expendable. Larkin could count at least fifteen other qualified naval men itching to step into his shoes.

And now that damned sub had landed two more parties. From here on it was up to Folsom, it appeared. Larkin was aware that the aurora was likely to ruin radio transmission but there was nothing he could do short of requesting Norwegian help which would result in innumerable complications. Number one of which would be to explain what Teleman was doing there to begin with. This reconnaissance aircraft was the closest thing to super-secret since the Manhattan Project. He doubted if even the Russians realized its full potential.

Larkin paced back and forth, pausing now and then to examine the radar and sonar screens. Their operators were relieved every four hours but Larkin had been awake now for nearly thirty-four hours and with only three hours of fitful sleep to interrupt.

"Captain," the sonar operator's voice was shrill with controlled excitement. Larkin moved quickly to the sonar console.

"The submarine is moving in towards shore." Larkin watched the blip head slowly in to a point of beach directly ahead. The crayon-marked Norwegian base was shown as six miles from point of contact.

Larkin thought quickly. If the sub moved in, one of the three parties must have spotted Folsom and his group. You could trust Folsom to avoid capture as long as possible. It was now a choice of revealing their position to the sub and take a chance that he could help or stay hidden and see what developed. Brutally he weighed the two possibilities. He could let Teleman be captured and taken aboard the sub, then wait until it had headed out to sea and sink it, or sink it first and take the chance on saving the men with fire support to shore. Four long years of convoy duty in the North Atlantic had trained Larkin in making and carrying out brutal decisions if need be—part of the reason he had been selected for this command over ranking officers. But Larkin also retained the ability to remain human and cool under stress.

"All hands to Battle Stations! Man and rig ASW gear! All engines, full emergency. Deploy the hydroplane." Larkin had made his decision and he hoped to God it was the right one.

The battle alarms hooted throughout the ship. Larkin dived into his command chair and strapped down quickly. The huge cruiser heeled sharply and came whipping around, bow wave already screaming back over the vibrating ship as it picked up speed. In less than forty seconds, the bow was out of the water and the hydroplane extending as the four boost power, marinized gas turbines

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screamed to full military power. Two minutes after sonar contact, the *John F. Kennedy* was whipping above the rolling waves at eighty-five knots. Through the bridge windows, Larkin could see the hatch covers over the huge subroc missiles slam back as they engaged and mounted above the deck.

"Range, twenty-five miles and closing."

"Range, twenty-three miles and closing," chanted the sonar man as the cruiser roared down on its target.

"Bearing change, 94° at twenty knots and moving."

The Russian submarine must have heard the cruiser's huge propellers and turned to make a run. On the plotting board on the starboard side of the bridge, a series of lights began to flicker as two dotted trails representing both ships moved; the sub running for the sea, the cruiser beginning to curve in pursuit. The sub was moving quickly but cautiously, as if he were not sure whether he was being chased or it was only his sonar picking up a stray echo.

Larkin was aware that there could only be one outcome—both commanders knew the stakes involved.

The Russian commander must have made up his mind. The sub's speed increased to forty knots. The range was less than twenty miles and closing rapidly. The sub turned and began to surface. The radar picked up the image of the conning tower and seconds later, the blip of a rocket arcing towards the cruiser. Simultaneously, the submarine disappeared from both radar and sonar, leaving only the blip of the swiftly approaching missile.

The cruiser bucked slightly as a salvo of missiles roared loose from the stern and slammed into the Russian missile, only short miles away. The range was now less than fifteen miles. The radar operator, swearing softly to himself, worked frantically to re-establish contact. Suddenly the blip of the submarine was back, but faintly and flickering rapidly; the cruiser shifted to the east slightly to close with it.

Larkin gripped the arms of the seat and watched the screen as the sub streaked for Soviet territorial waters. The radar blip disappeared, and the sonar went blank again. Ten minutes later the cruiser ran over the area where the sub had been when they lost contact. Larkin brought her around in a wide circle, cutting her speed back to sixty knots. The *JFK* began to describe greater overlapping circles, moving quickly eastward.

"Bearing contact, 36,195 yards, course 163°," the sonar operator shouted, "lost again . . ."

Larkin did not wait for him to finish "Missiles," he said quickly into the microphone. "Bring her around."

As the cruiser swung to port and jumped ahead, two *Subrocs* roared from their housings directly in

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front of the bridge. The glassite ports were wreathed in flame for a second and cleared in time to show in quick succession two giant splashes some seven miles ahead and the tremendous underwater explosion that followed. The sea formed an inverted bowl of boiling green water and shot up in a geyser of foam and spray. Caught in the column was the twisted submarine, momentarily outlined against the cruel, gray sky. Larkin didn't wait to see more.

"Flares!" he shouted. "And get on to that Norwegian base!"

Folsom felt sudden despair as he saw the third Russian party. MacPherson cocked his rifle and the sharp click of the slide brought him to his senses. Anger now replaced the despair, so close yet so far . . .

The northern sky blossomed suddenly into a brilliant shaft of fire. A signal rocket exploded high above the coast. It was quickly followed by a second and a third. Seconds later, a long drawn rumbling explosion rolled toward them.

The four looked at each other. Teleman saw that the Russians had stopped to stare at the flares. "The cruiser," Folsom shouted gleefully. "The explosion must have been the submarine."

Gadsen laughed and began dancing around. Folsom yanked the Very pistol from his pack and fired three answering flares directly above them in quick succession. The flares flamed brilliantly. From the sea they would be clearly visible against the black night sky.

"Oh, boy," he shouted, "run!" Folsom began running as fast as he could toward the southwest. The two Russian parties began to chase them, with the first running south and then west to cut them off. Two minutes later, the first rockets exploded and began to lay a fencelike pattern between them and the fleeing Americans. The barrage picked up in intensity as salvos screamed in, laying a square pattern that moved back toward the coast.

The four ran as they had never run before, the breath whistling in their throats, all thought of the cold forgotten as they strove to stay out of range of the barrage and the Russians. The pattern from the ship continued to rain down, shifting slowly to the north and west as if the gunner on the cruiser could actually see his targets. A rain, a curtain of fire seemed to blossom behind them until the din of the exploding missiles was a continual roar in the crystal air.

They pounded on, Teleman straining every last ounce of energy he possessed to keep up. MacPherson ran with his rifle in his hands, effortlessly leading the way. Teleman suddenly became aware that bullets were kicking up the snow around them. He faltered and threw a glance over his shoulder, but Gadsen was past and behind, giving him a shove forward before

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he could do anything about it. He saw the slight figure go to one knee, heard the sharp crack as he began firing rapidly. The lead figure chasing them screamed, the sound faint over the distance, threw up his hands and tumbled headlong. Bullets smacked around Gadsen but he continued to fire his M-15 coolly, the crack, crack, of the bullets abnormally loud in the still, cold air.

Folsom yelled at Teleman and turned, his rifle blazing towards the Russians. Gadsen fell headlong and Teleman heard the faint *plat* of the bullet hitting him. Folsom was running beside him now.

"Gadsen, is he . . . ?" Teleman panted dumbly.

"Shut up and run," Folsom roared.

Teleman fell and rolled over and over. He had time to notice as he came to his knees that the rocket barrage had stopped and more distant figures were once again running towards them.

Folsom dived beside him, and MacPherson came running back.

"It's no good, no good," Teleman gasped out, "I can't go any farther, those drugs . . ."

MacPherson emptied a clip at the approaching Russians and rammed a new one home. Both Folsom and Teleman began to fire, picking their targets as carefully as their ragged breathing would allow. Teleman propped his elbows on the iron-hard ground and sighted. The rifle jerked as he squeezed off a shot and the figure in his sights disappeared. He picked his targets and fired quickly. There were twelve men moving in on them in a line; all twelve bent low or crawling. Their shots were beginning to strike closely now. A bullet kicked a blast of snow and ice into Teleman's face. He shoved a new clip into the rifle and fired swiftly. Next to him, Folsom raised the Very pistol then lowered it. Less than a thousand feet separated the two groups of men . . . then the Russians were up and running back to the east.

Teleman watched them, stunned. Then he heard shouting and the staccato barking of heavy automatic weapons behind them. He turned quickly, half rolling to see a squad of white-suited snow troops running toward them from a Sno cat. Then he began to laugh. He was laughing in great tearing sobs when the Norwegian naval lieutenant ran up, to be confronted with the spectacle of three men alternately sobbing and laughing. ■

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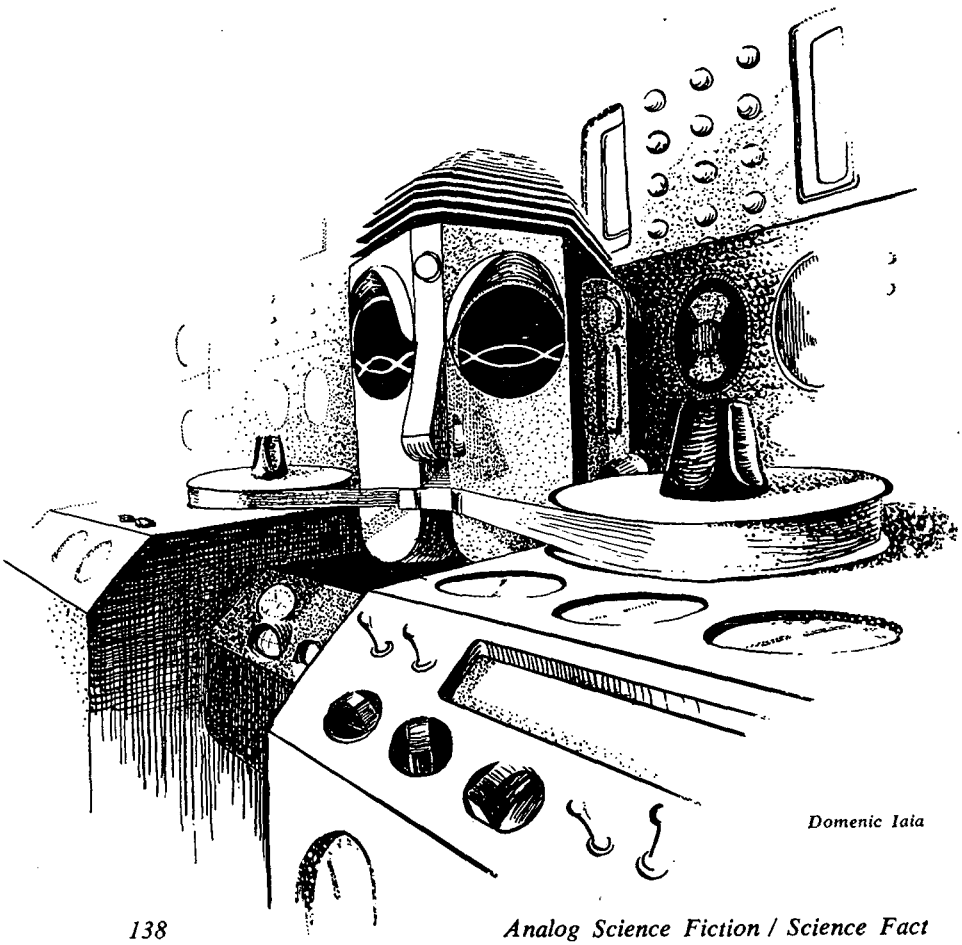
COUNTERCOMMANDMENT

The intention was to make the missile system foolproof. The system being a computer, they got precisely what they asked for—but not what they meant. **BY PATRICK MEADOWS**



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Joseph Nelson stepped into the elevator and pushed the button for Sector 13. This was the last of the series of descents that carried him, in quietly whining cubicles from the daylight streets of the small town built by the Army engineers near Omaha, farther and farther into the shadowless subterranean city of corridors lined with closed doors. The doors of the elevator disappeared into the walls and Joseph stepped out. He identified himself to the security guards stationed in front of this last stop.

"Joseph Nelson, of Computer Corporation, requisitioned by General Carter to investigate and correct a computer malfunction in Sector 13." He handed his green pass card and inter-sector movement authorization to the first of the men.

"Joseph Nelson, Computer Corporation, authorized to move freely through sectors one to thirteen. Pass number 193564. Welcome Mr. Nelson. Continue through this hallway; the arrows to follow are green in this sector."

"Thank you, Captain. You'll send the up-and-down box back?"

"Yes, sir."

Joseph followed the green arrows through the maze of corridors full of dead ends and false doors pointed out by arrows of various colors. The same questions that had been going through his mind since he received the instructions to proceed to the base continued to puzzle him. Why had General Carter needed a reserve technician to assist the Air Force personnel, men constantly in attendance to the machines and up to date on the programming changes that were made every day? Why, especially, a reserve technician who had become more a theoretician and would-be philosopher than an expert in computer repairs? He had been more involved lately in the semantics of highly complex computer systems than in the mechanics. In other words, he thought, I have become devoted to the study of cybernetics and its implications for the world of the future. How can I possibly help specialists on this one machine?

At the door indicated to be his destination, he punched out his pass number in a digital keyboard and the heavy steel moved aside to let him enter.

Joseph stood for a moment just inside the door looking at the activity around him. The room was as large as a gymnasium and was completely filled by the largest and most complex digital computer in the country, if not the world. There were walkways and corridors into and over the great machine and at least a dozen green-coated mechanics were busily withdrawing and replacing programming units like drawers of an overgrown Chinese box.

One of the men with a large badge indicating that he was the unit chief approached.

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"Identify yourself and your mission, sir, if you please." He checked some papers as Joseph clicked off the information.

"Glad to have you with us, Joe. My name is Thornwald. Major James Thornwald, officially. Call me Jim."

"Glad to meet you, Jim. Mind telling me why you need me?" They were already moving toward the primary access way to the machine. They climbed steadily toward the master controls as Thornwald filled him in.

"The answer to that is simple, Joe; but not the implications. Seven oh six will not respond any longer to commands directing it to perform its ultimate function." They stopped beside a panel of blinking red and green lights. Joseph saw clearly that the pattern of signals indicated an interruption of the final stages of actuated attack procedures. Thornwald continued, "At 3:10 this morning we received our warning note from the electronic monitoring of the central system in Mongolia that the Chinese had ordered the initial rounds of offensive ICBM's to be launched. We received instructions via the red phone from the President at the Pentagon underground city to retaliate and protect. That was three hours and twelve minutes ago." Thornwald looked at the red section on the wall clock stretched from the three to a point just beyond the six.

"That means that Omaha should have vanished at least three hours ago, Jim. It's not, take my word for it. There must have been a mistake; the sun is shining in the streets right now. Thank God that something has gone wrong here."

"There is no mistake, believe me. That warning note cannot be activated except by the depressed attack button in Peking. They began that attack! The only answer is that they have their difficulties and at this moment are trying to locate them. They know by now that we have ordered our attack and defensive missiles up and that we are in trouble, too. It's a race against time and technology." He turned on one heel and proceeded to the last stage of the stairs and waited for Joseph to reach him.

"Not much has changed in the master control unit since you and the others originally designed it." Thornwald was all business now. "We have replaced every packaged component with ten reserves; that makes eleven separate units for each of the programs. Each program has been checked and rechecked individually for circuit difficulties. But these are all printed circuits now and are factory perfect. But we have at this moment a group of programmers building all new components from the original designs. But we have found nothing wrong."

Thornwald stood back and allowed Joseph to verify everything

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that he had heard. He worked efficiently, as though he had never done anything else. He still knew machines and had an unerring instinct for dealing with complex electrical relationships. In any case, he had personally designed these panels so that any hot spot could actually be seen with the naked eye.

"Not a thing here, Jim. What does the troubleshooting unit say? That little masterpiece should have found the trouble immediately and repaired it before you would have known about it."

"Come on, this way. I have a feeling that we are going to have a talk about that article of yours in last year's *Journal*."

"You mean about ultimate referral? This is the sort of thing I had in mind, all right. I assume that the troubleshooter indicates nothing." They had reached the wall of dials, tapes, oscillating spheres and lights.

"Exactly; as you said in that paper: What's going to troubleshoot the troubleshooter?"

As they talked, Joseph read the gauges, flicked testing switches, observed the manipulations of the men working around him.

"The only feasible answer to that question was, of course, that men must be the final checkers. But how can men keep up with the incredible speed and diverse complexity of computers? So we had to make malfunctions visible to the human eye for each component, break the overall programming down into units like so many dresser drawers. and build spares enough for all the probabilities. All this just in case that 706 didn't repair itself, which it has been doing for a quarter of a century. Or is this a recurrence of something that's happened before?"

"This is the first instance since the system was put into use in 1967. And you remember that the whole organization from the red phone to the remote-controlled ICBM's was evaluated for reliability for ten years while SAC and various defense commands were still in operation. For a grand total of thirty years, then, nothing has happened until today to put the Cybernetic Missile System in jeopardy as a workable and foolproof guard against enemy aggression."

By now they were back at the blinking lights that signaled interruption. Joseph studied the pattern for a long time, puzzled by the slight irregularity in pulsation.

"Have you re-routed the data feeding into this unit? It's not reading right."

"Yes, we have. But let's go over it again. Sergeant, re-route unit K-16 through the standard 507 on panel S for K-16. The proof scope is at the bottom, Joe. This is one thing that has been changed a bit since you were here. When we were making the Master Records we had so much to go through the re-route setup that we built a separate outfit on the floor. Afterwards

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we just discarded the original because we found the floor model so much more convenient; don't think that it's the hot spot, though. It's exactly the same as the one the first engineers put in."

At the proving oscilloscope Joseph watched the picture of electrical events like a movie. He knew the protagonist, but could not believe that the villain could be that slight flicker and waver which could not be isolated completely from the protagonist.

"Jim, believe it or not, nothing is really wrong, in the way that you mean it and I mean it."

Thornwald waited as long as he could. "All right, Joe, what is it? And skip the semantics, please. My job is to get this thing going."

"In the simplest language . . . 706 is refusing to carry out the orders!"

A telephone had rung that morning in the White House.

"Mr. President, it's 3:10 on the button," a voice of husky calm related.

"Identify yourself and the watchmaker," the President replied. His free hand automatically reached for his wife's shoulder. She was already wide-awake though she lay absolutely still.

"Carter; Lee's watchworks." The speaker waited for the next signal; he was breathing evenly into the mouthpiece.

"Is it a cowardly foe?"

"Mr. President, in plain English, they're as yellow as they come."

The President drew a deep breath and threw the bedclothes back. With his feet planted firmly on the cold floor he gave the order that he had been expecting to give, dreading to have to give for three years. "General Carter, alert Omaha to prepare for defense and retaliation. Instruct the command to proceed to the War Room. No public Attack Warning until I so instruct CD from the Safe Room." He flung the telephone to its cradle and turned to face his wife, who was sitting up now. He kissed her quickly.

"You know what to do. And kiss the children for me until later." He was already pulling on a heavy robe and heading for the one-man, perhaps one-way, elevator to the president's shelter.

There the pushbutton telephones, labeled and all different colors, circled before him. He pressed the first one on his left. General Carter in the War Room spoke his own name. It sounded hollow and dreamlike in the president's bare room.

"Bill," began the president in an almost toneless voice, "have you had time yet to verify on all circuits the origin of that signal?"

"Yes, Stephen. The original impulse was accurately ascribed to the South Mongolian control center. There's no longer any doubt of that.

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The satellite analysis just registered final data."

"Has anything shown up on the board yet?" The heavy sigh denoted the end of a sustained hope gone, and at the same time an acceptance of the duties that had now to be performed, one by one.

"Not yet; there should be something in about one minute." The general spoke like a fighter pilot at peace with himself watching for the enemy over his shoulder; not afraid, merely expectant.

"I'm leaving the line open then while I get through to Omaha. You tell me the instant they show up."

The second button.

"Commander 706, Colonel Previtt." Another flat, calm voice of resignation.

"Colonel Previtt, this is the President; you are on full alert, ready for retaliation and defense?"

"Yes, sir."

"Then stand by the red phone until you hear my voice again. You will hear nothing until I open the line again. Do you understand?"

"I understand."

The third button.

"Near Space Monitor 437; Colonel Radcliffe."

The president wondered briefly how he and all the others could maintain that calm; or how long. Perhaps the years of hoping was all an act, even on his own part; perhaps they had all known that what was happening had been inevitable.

"Colonel Radcliffe, the President speaking. Have you intercepted any signals to release space-borne missiles from the Sinoviet sector?"

"No, Mr. President. Nothing has changed since three days ago. The standing satellites are inoperative and no additions are in evidence." Apparently the Sinoviets had given up trying to keep a working space missile system in orbit. It was too easy to blow out the controls from the monitor ships.

"Good. At the first sign of any unidentified object you must tell me. The line will be closed, but you can open it at will."

"Yes, sir."

His mind was jumping across the country now. San Francisco, Washington, New York; all the millions who were sleeping, dreaming, reliving yesterday, already going through the motions of tomorrow in their minds.

The fourth button. He could wait no longer for General Carter.

"Civilian Defense Headquarters; reservist Colonel Shaw." For the first time this night, a voice with an edge to it came through to the president. And no wonder, he thought. This man must now learn not only if people will hide from a nuclear attack, but whether they can. The estimated number of survivors after a nuclear war would probably equal the population of the thirteen colonies in 1750, and that only if all the shelters and survival tactics were used.

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"Colonel, this is the President. You may now instigate all emergency measures for protection against a nuclear attack." Shaw was the first man not aware until the call came that war was on. The president repeated the statement and waited for acknowledgment before he closed the line. He could imagine now the sirens, the repetitions over the radios being clicked on all over the nation, the mass confusion beginning.

He resisted an impulse to rest his head on his arms for a moment and turned back to number one.

"Bill, are you there?" he asked almost as though not expecting an answer.

"I'm here, Stephen. Still nothing on the board. They're about a half minute overdue unless the Sinoviets have succeeded in building an attack system that we haven't been able to uncover."

"That's not possible, is it? I've been told at least once a week that that is not possible. Is it, or isn't it?"

"Unless they have managed to build missiles that can travel undetected; for instance, under the sea from underwater pads. But we should know about it. I think that there's nothing we or they have done in the past twenty years that the other side hasn't known about. The only thing is that the hot button *was* pushed ten minutes ago."

"Then is it possible that they reversed the command? Is it possible that something is wrong with their electronic systems?"

"The answer to the first is no; because they know that we have a monitor on that attack button just as we know that they monitor ours. The answer to the second is, not likely, but possibly. In that case they could have repaired any defective unit by now."

"All right, Bill." His voice now carried decision and certainty. "Since as you say they must have ordered the attack, and either we can't detect the attacking apparatus or just possibly they have had a communications failure, I am now going to give the attack order to Omaha. You hear, Bill?"

"Yes."

"What is the code for retaliation and defense against undetected aggressor missiles?"

"Plan A; latent defense, immediate retaliatory launching."

The president opened the line to Omaha. "Colonel Previtt. Activate Plan A immediately. May God help us all." This time he laid both hands in front of him on the table and put his forehead down.

Joseph knew that Thornwald would ask him to repeat the diagnosis of the problem, so he reiterated in slightly different language.

"Let me say it another way, Jim, so that there is no mistaking what I mean. I think that 706 has made a decision not to carry out the attack orders."

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Thornwald gaped for a moment, put his hands on Joseph's shoulders while he stared into his eyes, and finally admitted to himself that the man seemed sane enough. "Joe, I guess I haven't paid enough attention to what you've been saying, or else to what you've been writing during the last few years. I've been brought up to think that machines can't think; are you going to tell me that we've been all wrong? Wait a minute; I want to hear you tell that to Colonel Previtt. Then I'll know that you're not joking."

Colonel Previtt looked like a beaten man. For three hours he had been under constant pressure to get missiles in the air before the Sinovi-ets succeeded in launching theirs. Every five minutes the phone from the Pentagon had rung for a report. "Joe, what you're saying is fantastic. What am I supposed to say to the President? This is a war, not a philosophical tea party. Just what do you mean by 'refusal to operate'?"

"Colonel, there are interfering wavelengths on the oscilloscope. This means that simultaneous impulses are present, and since the system allows only one impulse to be dealt with at one time, the computer has to choose on the basis of its memory banks which is to get priority. Normally the impulses are in sequence, and they are taken care of on a first-come, first-serve basis. Seven oh six has decided to react to the interfering wavelength and to let the attack order stand interrupted."

"Then do whatever you have to to knock out the interference. Major Thornwald, get him whatever he needs." He turned to answer the telephone.

"Well, Jim, this could be tough going. First, can you get the complete history of the use of this computer system. I mean for every single component since the day it was installed. Also an index to the memory banks of all nonmilitary data that may be recorded. This particular setup was used for the national records, wasn't it, before the Strategic Air Command and all manned defense outfits were demobilized?"

"That's right. Since then the Denver underground city has kept records up-to-date with the computers there. Do you think that somehow those documents could be setting up the interference?"

"That I don't know. But the trouble has to come from something in the total programming; there's nothing else that could show up like that on the scope." They reached the tabulex file brought out from the Records Department. "Here goes nothing. I really don't know what to look for. I think a punch code or a series of punch codes that would combine to cancel the attack command code. And we need help even when we find that. Could you send for Professor Norbert and Dr. Paulus? Maybe the

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four of us can come up with the right combination for this thing."

"General Carter, I understand you perfectly. What you are saying is that while we are waiting for the Sinoviet missiles to begin dropping on our cities, one of those infernal eggheads is in Omaha psychoanalyzing a machine. If the military had not allowed itself to be emasculated by President McKenna and his brainy boys, we could be over Asia right now, dropping the first bombs. If we live through this debacle, I hope that somebody has learned a lesson."

"We all know, General Ironton, that you fought against centralizing the defense. But there were too many close calls; too many false alarms that might have led to war. With so many men involved an irreversible mistake was bound to occur sooner or later." General Carter still kept an eye on the blip charts while talking and watched the commboard in front of him for a signal from Omaha. He was careful to keep the phone to the President open all the time, so that he could continue to hear the debate when he could listen and could speak whenever he wanted.

"I believe that it would be better to wipe out the rest of the world, if necessary, by accident, than to have one United States city bombed on purpose." General Ironton turned to watch the board and smoke his cigar.

"Bill, I want to say something to those in the War Room."

"O.K. Gentlemen, the President."

"I would like to clarify a few issues now, for the record. First, the Cybernetic Missile System has been constantly tested for thirty-five years for readiness and has never shown the slightest hitch until today. Second, apparently the difficulty is internal; that is, it seems that there is information being fed into the machine by itself contradicting the orders to attack. I mention this because it indicates that there has been no sabotage by foreign agents in order to attack us when we are defenseless. Third and last, for now, I have just received word from our space monitor system that there is similar interference with the machines in Mongolia. You might put your minds to these facts for a while and see if you can make any suggestions. That's all for now."

None of them had anything to say, at least for a moment. They all lifted their heads, ostensibly to look at the blip board on the wall above them.

Professor Norbert looked like the inspiration for the term "egghead." His large forehead was extended by baldness nearly halfway back to his crown; heavy-looking horn-rimmed glasses sat not quite in place on his nose; his tweed jacket exuded chalk dust.

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"Joe, do you remember the computer we set up in 1961 to play checkers and backgammon simultaneously? I presented a paper on it at the first meeting of the Cybernetics Council." Norbert was toying with a summary of documents recorded on the master tapes.

"Yes, I do, Professor. We arranged that the games should be completed at the same time, even though backgammon is a more complicated and a slower game than checkers. It was quite a problem, I remember."

"Do you also recall that in the course of running out those games, an anticipated situation arose in which, in order that the games come out even, a move was required in both 'tables' at once? And what the outcome of that incidence was, or so it appeared?"

"The machine was forced to decide on, or select, which move to make first, using other information than the rules of the games or the stipulation that the games were to finish on immediately serial signals."

"That's right, Joe. The machine was forced to 'decide' and decided for backgammon. And most important of all, it finally became clear that the basis for the decision was the relative weight or importance of the games as determined by the prepacked history of the games which we had fed it to teach the solutions to rare problems not covered by the rules and to teach master playing techniques. There were, we found, more special situations in backgammon, so that we had a much greater volume of information in the banks on backgammon. We personified the machine in saying that it had held that the best authority was the largest number of entries, or entities, if you will—almost a plebiscite, or one man, one vote principle."

"Yes, I recollect, Professor, the reactions of the Council members at that meeting. There was a great excitement over the possibilities discussed. But the subject was dropped by consensus of the Council and no other papers appeared."

The spark of an interested, inspired student returned for the first time in years to Joseph's eyes. "You think, then, that there is more weight on the side of not firing the retaliation missiles?"

"Correct. You'd better connect me with the President and the War Room and anyone else who needs to know about what is going on here. And bring in a console circuited by all the banks. I'll need Dr. Paulus with me for this, too. We've both waited for this a long time."

The President had all the lines open from the Pentagon to Omaha, the Civil Defense Alert Offices to the Space Monitor Unit. The only sounds that came over the wires to him, however, were those of machines humming and clicking re-

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lays. In the War Room General Carter and the others stared blankly at the empty blip board. Colonel Shaw listened with one headphone to the reports of Civil Defense efforts to evacuate cities or get the populace into protected positions away from windows, under desks or tables, into their shelters. There were already nearly a half million more protesting peace marchers in the streets of the country than had been expected. Either they believed that it was merely another test or they believed it was better to die walking than huddled into starvation groups underground. Colonel Radcliffe in his space capsule was watching the sunrise raise the Aleutians out of the Pacific and paint a gaudy line from pole toward pole.

Professor Norbert and Dr. Paulus sat with a few scratches on the pads before them, waiting for a signal that the console was ready for them. They knew each other well enough to interpret the relaxed brows and chins as signs of quite controlled elation. Dr. Paulus spoke first.

"Mr. President, this is Dr. Paulus speaking; are all the lines open so that you and the others can hear me?" He listened while all the stations affirmed clear communication. "Mr. President, there are probably some among the listeners who are going to find what we are going to say difficult to believe, hard to grasp, or impossible to accept. But we would like for you to hold any questions for a little while." Paulus knew that his words would have the ring of failure to some of those listening; he waited for his words to have weight when he began again. "When this Cybernetics Missile System was formed thirty-five years ago, we retained, you remember, our manned bombers and missile sites for ten years while we thoroughly tested the possibilities of protection and retaliation of a completely automated force. We found it to be as reliable in the defense of our country, and much more reliable in cases where the liability of error was great enough to cause a war by accident.

"During this testing period, we were also making use of the facilities here to record all our important national documents in a safe place impervious to nuclear attack. We even recorded the constitutions of all the states and the various translations of the Bible in wide use. We wanted, in brief, to have all the tracts on which our society had been based to be available for whatever survivors might be left so that they could build another nation on the principles of freedom as we have known them." He paused and waited for the small sounds of restlessness to die before he started again. He was hoping that he could say what he wanted to say without causing an uproar in the War Room; that would be the likeliest sector to raise objections and

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demands nullifying the success of which he was part, if not the author.

"We learned shortly after we had developed our CMS that the Sinoviets had completed a similar network and had recorded their history in much the same way as we had, through our documents. They even included Buddha, Confuscius, Laotse, and Russian sacred and political saints. All that I have said so far is to make clearer what I am going to say next. It became evident to experts in both halves of the world nearly fifteen years ago that all the memory banks of the computers controlled their operation, not just the infinitely complex attack and counterattack codes that were worked out. In other words, the computers would consult, on our side, the Constitution before firing any missiles, and on their side, they would consult, for instance, Buddha's sayings."

Dr. Paulus made a sign to Professor Norbert, who moved his notes closer to the screen to begin his summary.

"Gentlemen, I would like to pose a question or two to all of you before this report is completed."

"Go ahead, Professor Norbert." The President was puzzling still over the facial expressions of these men whom he had known for so long.

"First, is there any reason to believe that there is anything in the national documents that is contrary

IN TIMES TO COME

Next month's feature story will be "Second Seeded," by R. C. FitzPatrick—which has to do with an aspect of a very old problem, but a strictly science-fictional aspect. Juliet asked the basic question, "What's in a name?" and Romeo didn't have much of an answer for it.

FitzPatrick's version of the problem is quite different. No family feuding. No teen-age dramatics. Just . . . if you combine the perfect and functioning head of one baby, with the perfect and functioning body of another (who's suffered an accident that ruined his brain)—what's his name?

Because part of the story is the same. The real, and as Romeo and Juliet found, sometimes ruthlessly harsh fact is there is a lot in a name! ■ *The Editor*

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to the national good? Mr. President?"

"I feel safe in answering for all of us a negative to that question, Professor. Unless someone differs, go on."

"Does anyone doubt that the writings that our founding fathers based their lives and our country on, the Bible, support us in our beliefs and hopes for mankind?"

General Ironton with a wary voice gave a "No" to that, immediately seconded by several surer voices.

"If you will keep those two queries in mind, and all that Dr. Paulus told you before, then, I'll be able to bring this thing to a close. As you may know, all computers are capable of troubleshooting themselves and repairing themselves. They ask merely where the electrical circuit is at fault. If two responses are demanded at once, an interference is set up that is not a break in the circuit, but merely a pulse that cancels both responses. We, as men, however, can ask other questions and determine the source of the interference once we know that it is there. Joseph Nelson located the interference for us and we asked the direct question, in language that the computer could react to, 'Why has the attack order not been carried out?' "

Joseph moved into position in front of the screen. "We have brought in the console with a speaker that will render the answer to this question into spoken English. I am going to feed the data once more to the machine, and you will be able to hear the answer. Remember that the Sinoviets are at this moment probably doing the same thing and getting a similar answer in their tongue."

He punched a code out on the console and waited for the monotone. Like a four-hundred or a four-thousand-year-old voice it began with the Preamble to the Constitution, continued with the Bill of Rights, Lincoln's Gettysburg Address (". . . And that the government of the people, by the people, and for the people shall not perish from the earth . . ."), the Declaration of Independence (". . . All men are entitled to life, liberty, and the pursuit of happiness . . ."), the Charter of the United Nations, (". . . Determined to save succeeding generations from the scourge of war . . ."), and on to the encyclopedias of knowledge, the Magna Carta (". . . No freeman shall be . . . in any way destroyed . . ."), to the Moses tablets, ("Thou shalt not kill . . ."). The voice droned on far into the night uninterrupted; there was no change of inflection, no way to ascribe censure to the words, no hint of flexibility in the meaning; here were the old unfulfilled hopes of all the generations of men set forth as irrevocable laws that would govern all men everywhere, forevermore. ■

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the reference library

P. Schuyler Miller

JULES VERNE'S HEIRS

If special awards are passed out for service to science fiction during 1965, one should go to Damon Knight for giving American readers their first anthology of modern French science fiction. A companion award belongs to Maurice Renault, editor of *Fiction*, who discovered and encouraged the ten writers represented in "Thirteen French Science-Fiction Stories" (Bantam No. F-2817; 167 pp.; 50¢).

Renault started his magazine in 1959, nominally as a French edition of *Fantasy & Science Fiction*. He began to publish original stories as soon as he learned who could write them, and Damon Knight began to read and translate them. Several in this collection have appeared this side of the Atlantic in his English versions, and we can hope there will be more.

Three of the ten stories are not science fiction, though they are "SF" in Judith Merril's broader interpretation. Suzanne Malaval's "The Devil's Goddaughter" is a saucy version of the old folktale, Henri Damonti's "Olivia" is a kind of *Ronde* of accelerated transmigration, and Boris Vian's "The Dead Fish" is a fascinating bit of surrealism and one of the best stories in the collection.

The outstanding talent revealed by the anthology, however—and I suspect the editor agrees, since he has chosen three of her stories—is Nathalie Charles-Henneberg, the "most read" SF writer in France. In three totally different tales, "Charles Henneberg" shows an intricate imagination-cum-style that is somewhere on the sober side of Cordwainer Smith. In "The Blind Pilot" there is the creature from a water-world who telepathically envelopes and absorbs the sightless veteran. In "Moon-Fishers" there is a new kind of time-transposition story, weaving past and present, space and Earth together exotically and horribly in ancient Egypt. And in "The Non-Humans," Mme. Charles-Henneberg brings Renaissance Florence to life with a story of the apprentice painter, 'Nardo, and his strange model.

Two other stories are especially good, and closer to the "image" the publisher is trying to suggest as "French." Claude F. Chienisse, in "Juliette," has written a thoroughly delightful story about a future doctor whose mistress is an automo-

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bile. It observes the formalities of the aging-mistress story in subtle and gently mocking ways. And Catherine Cliff, in "The Chain of Love," has a warm, delicate little fable about the young girl who—the reader realizes before she does—is the pet of an extraterrestrial.

I don't know whether it is characteristic of French SF, and Damon doesn't tell us, but three of the stories are plagued by too-literal titles of the kind that were typical of Early Gernsback. Henri Damonti's "The Notary and the Conspiracy" is a kind of time-travel story in which people can experience life in the past, and a notary becomes involved in a conspiracy against the Medicis. Pierre Mille's "After Three Hundred Years" shows a country town rediscovering the joys of the past, and Gerard Klein's "The Monster" simply enough plants a monster in a city park. That all three stories overcome the handicap of their banal titles in the telling of their not-quite-so-obvious stories should be obvious: they wouldn't be here, otherwise. Claude Veillot, on the other hand, has given his fresh treatment of the equally venerable monster-come-to-eat-us plot the tempting title, "A Little More Caviar?"

Finally there is the story that the publisher has chosen to advertise as typically French and representative of the book: Alain Doremieux' "The Vana." In a future where population pressure has made sex the Frenchman's conversational rather than avocational pastime, these parthenogenetic female animals from a planet somewhere in Orion are mistress-surrogates with none of the legal and economic drawbacks of a real woman. But Slovic falls in love with his Vana. (The story, Damon Knight tells us, was rejected by an American men's magazine—to the author's amusement.)

Two pages of notes on the authors show that they are as various as the American and English breed—Renaissance people. They are lawyers, teachers, technical translators, housewives, journalists. Klein was established at eighteen; Mille died in 1941 at the age of seventy-six—probably the reason for the old-fashioned title of his story. Most of the others are young. May they write more and more, and Damon Knight translate it, and someone publish it for us!

ANALOG 3

Edited by John W. Campbell • Doubleday & Co., Garden City, N.Y. • 1965 • 269 pp. • $4.50

This third in the new series of annual anthologies from Analog should be especially popular with the scientists and engineers who bewail the loss of "old-fashioned" science fiction from the magazine. Two of the eight stories are straightforward technological yarns built around a way of thinking they'll recognize and appreciate, and two

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more utilize physics and chemistry to take the Establishment down a couple of pegs. The others are just about average for the magazine: old themes, competently handled to give them a fresh surface.

John Berryman's "The Trouble With Telstar" is a gem of not-too-far future technology. Its hero is a very young and green engineer whose schooling has failed to put across the concept that science and technology are not intricate games —that you make tests to get usable answers, not to get a column of numbers you can file. Once the light has dawned, he shows an enjoyable pigheadedness in going out where only an astronaut can go, and pinning down those answers.

Christopher Anvil's "Not In The Literature" is lighter, but every bit as fundamental. A civilization which is getting into space by using purely mechanical forces and interactions brushes off the layman who has discovered electricity. Page Murray Leinster's address at the Washington Convention in 1963, in which he mentioned "lost" technological techniques of the Nineteenth Century.

In two very different stories, Winston P. Sanders' "Industrial Revolution" and Johnathan MacKenzie's "Thin Edge," the Free Enterprise society of the asteroid belt becomes a little too successful to suit the Establishment back here on Earth. In Sanders' story, a crafty military man thinks he has figured a way to take over the asteroid for its own good; a craftier businessman turns the nature of the beast against him. In MacKenzie's, the logical but extraordinary properties of an asteroidal invention are used to blackmail the Welfare World into allowing the Belt its economic freedom.

As for the others, Gordon Dickson's "Hilifter" projects the privateers of Eighteenth Century America into the future. The mother world won't give the colonial planets enough of a trade margin to become economically self-sufficient—so they set out to steal a merchant fleet. And do. Rick Raphael's "Sonny" is the old one about the hillbilly superman—this time a supertelepath. To be successful, this kind of story has to be developed a little more outrageously than this one.

Seaton McKettrig's "A World By The Tale" is a conservative satire on our world of too-high taxes, too much regimentation, too powerful government, and the lot of authors. Its hero writes a book that becomes a galactic best-seller—and the economics of that simple fact are something you should contemplate.

Finally, Clifford Simak has another of his pastorals about men-of-good-will in the inhabited universe, in "New Folks Home." Gentle, pleasant, nostalgic for the country boys among us.

For my money, this is the best of John Campbell's three offerings from Analog.

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Dear John:

Your readers ask such lovely questions. Here goes:

There are essentially three ways in which energy can be transferred out of a controlled fusion device. The amount of energy transferred by any one mechanism, however, depends on whether the fusion reaction is deuterium-tritium (D-T) or deuterium-deuterium (D-D). With a D-T reaction, which is much cooler, about 5% of the total energy release is in the form of bremsstrahlung (soft X rays). About 15% is taken up by charged particles, i.e., alpha particles and protons, and the remaining 80% is in the form of energetic thermonuclear neutrons.

With a D-D reaction, the percentage of bremsstrahlung is roughly the same, but the energy carried by the neutrons is drastically reduced. It turns out that only about a third of the energy is transported by the neutrons while 60% of it is transferred by charged particles.

In the case of the bremsstrahlung and neutrons, the problem is not one of getting them through the retaining magnetic field, but rather one of utilizing them once they have passed through. As you surmised in your questions, it is the charged particles that make life difficult, although you used the term "spent gas" which is not quite correct. The reaction products are highly ionized and quite energetic.

Assuming a D-T reaction, the main problem is converting the energy carried by the thermonuclear neutrons to usable power. This might best be done by absorbing the neutrons in a suitable moderator, such as lithium, and thus converting their kinetic energy into heat. Surrounding the reactor with lithium might well have the added advantage of regenerating tritium according to the following reaction:

$$n + Li^6 \rightarrow T + He^4 + 4.8\ MeV$$

Any moderator used would probably have to be in suitable liquid form so that the heat generated in it by the neutrons could be transferred to external heat exchangers, connected in turn to equipment for generating electric power.

Now how do we get rid of those charged reaction products? The answer depends to a large extent on

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whether the reactor operates continuously or is pulsed. If it is pulsed, there is no problem. As soon as the magnetic field disappears, so will the charged particles.

Even assuming continuous reactor operation, the reaction products will diffuse slowly through the containing field. I would assume that the more energetic the products are, the more rapid this diffusion would be. These charged particles, in combination with bremsstrahlung, however, pose a very serious problem to the walls of the reactor. Most simply put, the walls may very well vaporize.

One way to get around this would be to use a "divertor" such as that used on the stellarator. With this device the outer lines of magnetic flux are diverted into a large chamber. Since the charged particles are following these flux lines, they can be diverted safely away from the walls of the reactor itself. The particles strike the walls of the chamber, which is much larger than the reactor itself and give up their kinetic energy as heat. However, since the divertor chamber is quite large, the heat can be effectively carried away from its walls causing undue damage.

In a D-D reaction the situation would be quite different, however. More than half the energy of the reaction would be carried by the reaction products. Assuming a sufficiently strong magnetic field—and that's a big assumption—these charged particles would be retained within the confining field. In principle, their kinetic energy would be transformed directly to electrical power.

A way in which that might occur would be through the action of the plasma on the magnetic field. As the thermonuclear reactions occur, the plasma temperature and pressure increase, causing the plasma to expand against the confining field. This expansion in turn causes variations in the magnetic field which could be made to induce voltages in adjacent circuits. Thus, in effect, we have direct electrical generation of power. Any reactor producing power in this fashion would probably be pulsed, somewhat similar to a Diesel engine.

I want to emphasize that it is highly unlikely that an economical, power-producing controlled fusion reactor will be built within the next decade. Even assuming that controlled fusion will be a reality, all indications now are that such a reactor will be an extremely expensive proposition. These points were not covered in the article since its purpose was a review of the current status of controlled fusion research in this country.

ED WALTERSCHEID

I keep remembering that as late as 1935, Dr. Robert Millikan said atomic power would take "250 years at least." And in 1938, Dr. Edward Teller said we might have it around the year 2,000.

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Dear Mr. Campbell:

I do not usually care too much for editorials. Your editorials, however, are a highlight of the magazine.

Your July editorial was one of your best. It raises a very important point and an equally important question. I am willing to agree that our foreign policy, while not being "imperialistic," is certainly arrogant. It is obvious that the newly freed nations are not taking to the idea of democracy too well. They are not ready for it yet.

As is obvious from what is happening in South Vietnam, the people there are not ready to have a democratic form of government. This much your editorial is clear on; but since they are not ready for democracy, and are ready only for a rigid and honest military dictatorship, what are we to do? We have to do something about the "unsettled" political conditions there; but just what should we do?

There are two obvious choices. We already know that they are not ready for a democratic form of government. The other obvious choice is to give them what they are ready for: a strict, honest military dictatorship, a rather rare commodity! The only way to set up an honest military dictatorship is to set up and support one of our own. A dictatorship that is completely controlled by the United States. This solves one problem but raises another one: What do we do about the resultant bad publicity? This will justify the claims that we are imperialists.

Unsatisfactory as it is, it seems that the best thing to do is to continue on our present course, put more emphasis on setting up a more stable government, and try to educate the people so that they are capable of making a democratic form of government work.

All in all, your editorial was excellent. I hope that Analog continues to maintain such a high standard of quality both in stories and in your editorials.

FRANCIS HERTEL
3508 E. Mildred
Wichita, Kansas

In an earlier time, when Americans weren't quite so afraid of the tender feeling of World Opinion, we ran into an almost identical problem. An Oriental people who'd been sloppily ruled by a Latin government—that government was ousted—the people weren't then ready for democracy—we established a kind of dictatorship and maintained it for more than a generation.

The World Opinion is terribly against such awful behavior and Imperialism-Colonialism now, of course. But the Philippines today seem to be among the most unified and best-integrated democracies in the whole East.

The problem is this: What do you do when What Everybody Knows is, in fact, a completely unlivable fantasy—tell them it is, and solve the problem, or conform and go nuts?

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for the fancy Park Avenue apartment district. And it's clean and crime-free *not* through the special efforts of the City; the colored people who live there see to it.

I have heard of no complaints whatever concerning "police brutality" coming from Chinese. (They discipline their own children, and don't wait for the police to try to do it for them.)

It is absolute nonsense to say that a ghetto *automatically* produces dirt and criminals. The Chinese prove that that's a false notion.

There's been a lot of talk about civilian review boards to check on "police brutality." I have a suggestion. Since the accusations of brutality come to such a large extent from the Negroes, and are directed against White police, let's have a board dominated by racially neutral arbiters—Chinese. I have a strong feeling that the complainants would howl in dismay at the idea; the Chinese have the lowest crime rate in the city, which means a solidly established respect for law, order, and discipline—for nonimmunity. They do *not* hold that punishment is "mere vengeance," and practice the alternative proposition, that punishment is necessary to guidance.

Another standard proposition about ghettos is that they automatically discourage individuals living in them from seeking or even accepting education.

The term "ghetto" originated with the Jewish districts in European cities. These sections were, therefore, characterized by high crime rates, excessive juvenile delinquency, and general rejection of education?

The number of Chinese who have somehow managed to become major scientists—despite the claimed impossibility of achievement starting in a ghetto, with a colored skin—is worthy of note.

The extent to which men from the Jewish ghettos somehow overcame that "impossible" problem of education to become a major force in every intellectual field of endeavor suggests that it isn't ghetto-living that prevents achievement.

And integrated schools obviously aren't necessary for achievement, either; the Jews were, for centuries, denied entry to nearly all the great schools of Europe—and yet somehow managed to turn out great intellectual leaders for all those centuries.

If you insist on blaming the carburetor for the failure of the car to start, when it's the ignition wire —*you can not solve the problem.*

If you insist that it's segregation and ghettos that cause the problem the Negro faces—*you can not*

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solve that problem.

Because that's not where the problem lies.

It's not skin color; the Chinese had that problem, and their young people are decent, law-abiding, self-disciplined youngsters who are well-educated and are achieving in many fields.

It's not ghettos and segregated schools. The Jews proved that didn't matter, centuries ago.

It's not that a history of being rejected and demeaned leaves a stamp that can't be overcome. The Irish, Jews and Chinese all encountered the problem. So did the Italians. So did practically every ethnic group that moved into this continent. (Including the original Scotch-English settlers, who were very lethally rejected by the then-dominant majority.)

The problem seems to lie in this question: What's the difference between "punishment" and "torture"?

Unfortunately, that problem lies in the subjective, not the objective, realm. Each involves the objective fact of pain deliberately inflicted. But whether that pain reacts on the individual personality as "punishment" or "torture" depends entirely *on the recipient's interpretation.* A flogging rates as "torture" to the individual who cannot accept that he did anything wrong—and as "punishment" to an individual who recognizes his own choice and actions earned what he's getting.

If an individual holds "This is cruel and vicious vengeance this enemy is inflicting on me," he will undergo torture, and seek to avenge it in turn.

Another individual, with a different orientation, in the same situation may hold, "Well, they caught me at it, dammit. I knew they might—so I get a flogging." This doesn't mean that he agrees with his punishers—but that he acknowledges that they are punishing, not torturing, him. That doesn't keep him from continuing to be a rebel—but it does mean that he doesn't see himself as the victim of cruel and vengeful and wicked foes. He doesn't pity himself.

Now an individual oriented to the idea that punishment is *always* evil and is *always* mere vengeance —*cannot be punished.* He can only be tortured. To him, the police using force to restrain his vandalism are "brutally" interfering with his Natural Right To Immunity—they are torturing him by frustrating his desire to see that building go up in flames, to loot that liquor store, to smash the windows and grab those radio and TV sets. To him, any force used to restrain his unlimited freedom to do what he wants is torture and brutality.

Because—face it!—any discipline is painful. There are three kinds of discipline: Universe Discipline, Other People Discipline, and Self-discipline. But they're all pain-

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ful. Stick your finger in boiling water, and you get Universe Discipline. A child who's slapped away from sticking his finger in a live electric socket is getting Other People Discipline. When he gets older, he'll keep his own fingers out of the high-voltage wiring—Self-discipline. But each kind is painful, for each is an imposed frustration of a desire, which is psychological or emotional pain.

The police have as their function the imposition of discipline on those who lack self-discipline. They rescue children who've fallen in the pond, or got stuck in pipes, or ran into the street and got hit by cars. They arrest burglars, rapists, and murderers. Their business is to supply the Other People Discipline required by those who lack Self-discipline.

To one who denies that discipline should exist, this is torture. It's deliberately inflicted pain—emotional pain of frustration at the very least. Therefore, the police are clearly being brutal; their brutality is inherent in the fact of their deliberately frustrating the non-self-disciplined individual's desires.

All of which orientation stems from that lovely piece of crackpottery the psychologists introduced: "Punishment is always bad; it's mere desire for vengeance, and harmful to the child's ego."

The Chinese have a five-thousand-year old tradition of discipline. So do the Jews. They could, and did, live sanely and peacefully in the ghettos, in the close-packed living where every individual is constantly rubbing against every other.

The Irish, when they first came over here, didn't have that tradition. The Irish created America's first slums, and a reputation for being a brawling, undependable, dirty, ignorant people. It took them a couple of generations, but they started by disciplining each other, and wound up learning how to live as ambitious, but self-disciplined people.

The Chinese have, also, an ancient tradition of "Face"—of the importance of reputation. The Chinese felt strongly that the behavior of any Chinese was a reflection on the reputation—on the Face—of all Chinese. (Madison Avenue's taken over the idea and calls it "Image.") Wherefore, every Chinese felt that the behavior and earned reputation of every other Chinese was his personal and direct concern. If one Chinese were a crook, a criminal, slovenly and lazy—why, it impaired the "Face" of other Chinese, by indicating that Chinese were such undesirables. If one Chinese were a cheat—it impaired the reputation, the Face, of other Chinese. Wherefore the other Chinese took steps to see that the cheat stopped damaging *their* Face.

Today, a New York business-

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man knows he can trust a Chinese businessman to meet his debts, and to deal honestly. If, for some reason, the Chinese does not meet his debts, one of the Chinese Societies will pay them in full for him. The Chinese Society will then deal with the defaulter. The reputation of the Chinese has been protected—and if the reason for default was an honest one, the defaulter will be aided in re-establishing himself. If he defaulted by reason of cheating, measures will be taken so that he does not have any desire whatever to repeat.

The brawling, slovenly, shiftless Irish were disciplined in a basically similar manner by their fellow Irish who, like the Chinese, felt that what any Irishman did was a reflection on all Irish.

Both the Chinese idea of Face, and the Irishman's feeling that he himself would be judged by the behavior of every other Irishman, rest on an absolutely one hundred per cent valid mechanism.

The simplest way to express it is in terms of what I call the "Elsa mechanism," in honor of Elsa, the Lioness. Many of you have, I'm sure, read the two delightful books about "Elsa"—"Born Free" and "Living Free," the biography of a wild African lioness who was raised from orphaned cubhood by a pair of white African game wardens. Elsa, as a full-grown lioness, was friendly, gentle, trustworthy, and fully co-operative with human beings. She was playful, but careful to recognize her own strength and weight. If you read those books, you'll learn how warmly affectionate and genuinely friendly an African lioness can be.

So the next time you're walking across the African veldt, and see a full-grown lioness come bounding toward you—what will you do?

Unless you're insane, you'll raise your rifle and do your best to drop the three hundred pound beast before she reaches you.

Of course, if it happened to be Elsa, happily bounding toward you in friendly greeting, that would be a cruel injustice.

It would be a case of an individual suffering gross injustice because of the reputation—well earned!—of the statistical group, Adult Lionesses, of which she was a member.

In other words, the necessity of real-world statistics will force any sane individual to react to the most probable situation—and the most probable situation is that a powerful carnivore is attacking with motivation of converting you to manburgers.

Statistically speaking, the Negroes lack self-discipline. Suppressing the publication of crime statistics does not change those statistics. The fact that some individuals are brilliant, highly ethical, thoroughly self-disciplined gentlemen in the finest sense of the word—does not negate the

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validity of the Elsa Mechanism. Those individuals will suffer gross injustice—because of the reputation their group has earned.

That injustice to individuals will, moreover, continue indefinitely, no matter what laws may be passed. Prohibition had a better chance of stopping the consumption of alcohol than a law has of stopping the statistically based reactions of human individuals.

When lack of self-discipline—revolt against any and all discipline—explodes into a vandal group sacking a major city, the loss of

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C. Total Paid Circulation	85,884	88,300
D. Free Distribution (*including samples*) By Mail, Carrier or Other Means	1,697	1,185
E. Total Distribution (*Sum of C and D*)	87,581	89,485
F. Office use, left-over, unaccounted, spoiled after printing	55,495	53,937
G. Total	143,076	143,422

I certify that the statements made by me above are correct and complete.

(Signed) Robert E. Park, Business Manager

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Face involved can not be repaired by passing a new law saying we shouldn't notice it.

If the National Association for the Advancement of Colored People wants to truly advance the Negroes—they might learn from an older, wiser people, and study the Chinese methods. Or the younger and more ebullient Irish, who solved the same problem, in the same basic way.

The Negro must discipline the Negro. So long as the Negro leaves the problems of discipline up to the Whites, the Negro will not be self-disciplined, and will feel that he is a victim of Other People Discipline, and Other People Frustration. He'll feel that, because he truly will be—forever and ever, world without end, *until he himself takes over the job.*

The Chinese and the Irish were right; what any member of a group does, *does* reflect on every other member, whether that other member likes it or not.

If a White group imposes discipline, the disciplined individual will inevitably have a strong tendency to feel that the aliens are imposing cruel torture. If a Negro society imposes discipline, it will come far closer to being accepted as punishment and guidance.

The deep and simple basic of the problem is—*the Whites can not solve this problem, no matter what they do.* Because *anything* they do is necessarily wrong.

Only the Negro himself can solve it—because it must be solved by *self*-discipline, and *self*-respect, and *self*-help.

The ones who suffer the greatest injustice now are those fine individual Negro men and women who, because of that Elsa Mechanism, are denied the acceptance their individual personalities merit. It's tough—but it is just as inevitable and inescapable as any other law of statistics. The individual Negro who can't stand the slovenly, violent, thieving ways of his Negro neighbors naturally wants to move to a better disciplined neighborhood.

But . . . the individuals in the better-disciplined neighborhood are inescapably going to react to the Elsa Mechanism, and identify him with the Negro neighbors that he himself wants to escape.

In seeking to move away from their neighborhood, he is trying to do what he so condemns—relegating his undesirable neighbors to a ghetto, geographically removed from himself.

Man-made legislation, seeking to contravene a law of Nature, can at the very best be futile. The Elsa Mechanism is based on the laws of statistics. Trying to change it by passing laws is about equivalent to decreeing that, henceforth, the value of π shall be 3.0000. . . .

Maybe somewhere . . . but not in this Universe!

The Editor.

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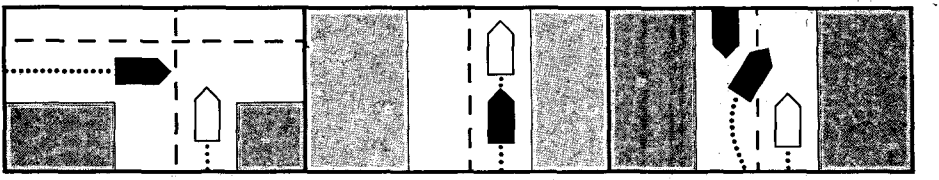
You will. Will he?

Maybe you obey stop signs and signals. Some drivers don't. So never assume the right-of-way blindly. Protect yourself by driving defensively.

If someone follows you too close, don't speed up. Slow down a little and encourage him to pass. Watch out for the other guy and stay out of his way.

When being passed, don't fight it. He may cut you off. Let him have his way. Remember, being in the right isn't enough. You could be dead right.



Watch out for the other guy!

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Lo How A Rose	O Holy Night
Dance Of The Sugar Plum Fairies	March From Babes In Toyland
O, Little Town of Bethlehem	For Unto Us A Child Is Born (Messiah
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